

COMPUTER WORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper - Second-class postage paid at Chicago, Illinois

Vol. V No. 28

July 14, 1971

Price: \$9/year.

Nasu Offers Consultation To Members

By Phyllis Huggins
Special to Computerworld

CANOGA PARK, Calif. — Nasu, the Independent User Organization for System/3 Users, has moved ahead with an innovative program for a problem/solution data bank.

Irwin Cohan, president of the group, said it is setting up a seven man consulting team to answer problems sent in by users.

All seven consultants are highly qualified and in effect will give each user the benefit of his own consultant, he said. Some of the consultants are Ph.D.'s and a few are former members of the System/3 design team who have now set up their own businesses.

Cohan believes this is the first time any user group has offered this type of service to its members.

Solutions to problems will be published in Nasu's monthly newsletter. At the same time, the problem/solution will be coded and stored in a data bank so there will be no danger of "reinventing the wheel."

"Instead of just building a library of programs and applications, we are also building a library of problem solutions," said Cohan.



LOSER? Believe it or not this young lady didn't measure up in a computerized girl-watchers contest. Story on Page 4.

Secret Report Sparks Row: Who Will Control Police Data Banks?

By Joseph Hanlon
Cw staff writer

WASHINGTON, D.C. — A still secret government report has touched off a bitter fight within the government on control and regulation of computerized police information systems.

Federal aid of nearly \$30 million has resulted in a boom in the development of such computer systems, according to the report, and by next year all but three of four states will have systems.

Some state systems will contain data on up to wanted persons, but others will contain intelligence information, and some will add criminal histories (rap sheets) of everyone in the state who has ever been arrested. Most systems will be tied together into a national network.

The new systems represent a serious threat to individual privacy and require "stringent" new controls, according to the confidential report by the Law Enforcement Assistance Administration (LEAA). Controls must include strong federal laws, the report declares.

Police departments and the FBI now have a free hand to collect and exchange data. They believe their own internal rules provide sufficient control, and have launched a strong fight against the outside control re-

ported by a new law.

Other government agencies, including the Secret Service and the Internal Revenue Service, are fighting the LEAA proposal because they fear such a law might lead to other laws regulating their operations.

LEAA's original proposals for strong legislation were "substantially whittled down by the top levels of the Justice Department," according to a government source.

The proposed regulation contained in the LEAA report is so weak as to be virtually meaningless. Only one safeguard of individual privacy remains: a person would have the right to see his own rap sheet (but not intelligence data about him).

But law enforcement officials get two benefits: the attorney

general would have the right to disseminate rap sheets and intelligence outside the law enforcement system, and the law would prohibit penalties for the misuse of rap sheets.

Yet the proposed law is still too strong for some government officials, who have kept the report bottled up despite the fact that it was required by law to be released May 1.

'Urgent Need' for Systems

The \$30 million federal funding for the new computer systems has been distributed by LEAA, and the report notes the "criminal justice system has an urgent need for computerized information and intelligence systems."

Intelligence systems can be ex-

(Continued on Page 2)

360/20 Users to Get Another Alternative

By Michael Merritt
Cw staff writer

WALTHAM, Mass. 360/20 users thinking of upgrading to System/3 have a good alternative in Honeywell's newly announced Model 105. The \$1,000/mo system even boasts a bundled software package to translate the 20's RPG programs to Honeywell RPG.

Filling the gap between Honeywell's Model 58 and 115, and competitive with IBM's System/3, the new 105 is disk-oriented with Cobol and Fortran, as well as RPG availability.

The 105 comes partially unbundled. Thirty days of on-site system support, 32 hours of testing and debugging, education at Honeywell sites, and software are included in the system price.

Further support, debugging, and on-site education are charged to the user, a new policy for Honeywell.

The 105 is comparable with the rest of the 200 series.

The translator, called Liberator/20, converts the 360 RPG to a form acceptable on the 105, 115, and 115/2. Liberator/20 for card-oriented 20s will be available this Fall, and the disk version in the first quarter of 1972.

Deliveries of the 105 will begin in the last quarter of this year, a Honeywell spokesman said.

The CPU is similar to that of the 115. Main memory cycle time is 3.5 usec, and basic memory is 16K (characters), expandable to 24K or 32K. The disk

drive subsystem holds 9.2 Mbytes, and can be increased to 36.8 Mbytes. Disk controllers are CPU integrated.

Two simultaneous read/write channels are standard, and a third is optional. This enables the 105 to function as a local or remote batch processing terminal.

The minimum configuration includes a 300 line/min printer, and a 400 cpi/min reader.

The systems rent from \$1,600 to \$3,000 a month.

Honeywell's main selling point to 360/20 users is the ability of the 105 to run both RPG and Cobol programs. The 20 is for the most part restricted to RPG, which helps beginning users enter EDP through its simplicity, but limits flexibility.

A basic 8K card-oriented 20 (submodel 1) rents for about \$2,600/mo, while a 16K, 5

(Continued on Page 2)

Cuts Duplication

New Zealand Banks Use Utility

By Beahan O. Szuprewicz
Special to Computerworld

WELLINGTON, New Zealand — The Databanks Systems Ltd. of New Zealand is not only the largest computer utility network in all of Australia. It is also something of a nationwide monopoly speeding interbank transactions for the country's five trading banks.

Databanks Systems is owned by the banks themselves, is sanctioned by the government, and is aggressively pursuing non-banking business.

Taking advantage of considerable excess computing capacity during business hours, Databanks is in computer services business. It is a formidable competitor as it can afford to sell its machine time at half the prevailing cost and also knows where the business is because of its banking operations.

Databanks also operates the largest computer system in New Zealand — an IBM 360/65 in its Auckland computer center. A

360/40 and 30 are also installed there and are linked with a 360/40 and 30 at the Wellington center. In all there are six computer centers covering the country.

NCIC Wins in Test Case

By Edward J. Bride
Cw staff writer

WASHINGTON, D.C. — The FBI's well established computer network has won what appears to be its first legal test.

In a recent federal case, a defendant claimed that using the National Crime Information Center (NCIC) and its replies to inquiries could contribute to an illegal search. A federal court ruled for the government, in U.S. vs. Golemski.

According to the FBI, the decision indicated that a car detained at a police station after a traffic arrest may be searched without a warrant, if NCIC re-

ports the vehicle was stolen.

The NCIC reply thus becomes the equivalent of "probable cause" that an offense has been committed, which is necessary before a search can be conducted without a warrant.

In this case, a vehicle had been stopped and the driver charged with a traffic offense. The local police officer observed the vehicle identification number on the dashboard as a Honeywell spokesman said.

The policeman then caused the vehicle to be taken to the sheriff's office, based on the traffic (Continued on Page 4)

On the Inside

DP Hops Aboard,
Correlate War Data

ADR Claims 'Ransom'
Superior to CRJE

Page 6

Communications 12

Computer Industry 23

Editorial 28

Finance 26

Associates 10

Software/Services 11

Systems/Peripherals 17

Consortium Cuts Banking DP Expenses

(Continued from Page 1)
Databanks started, it was IBM which said it could not be done. Due to perseverance and the energy of Gordon Hogg, Databanks' managing director and founder, the integrated approach to data processing for all the banks is not only working but is saving the banks money by eliminating significant software and hardware duplication.

Decimal Conversion

It all began well before July 1967 when New Zealand officially changed its pounds into dollars and became a decimal currency nation. New Zealand banks faced a double problem at the time.

One was the obvious need for decimalization of all its existing systems. But these were also the days when data processing began

making inroads into the country's banks.

In a way the emergence of both problems at the same time was probably responsible for the final solution in the form of a common data processing consortium.

Databanks is constantly introducing new services for the banking industry to improve its services. Recently it began a new money transfer system based on schedules of payments subject to prearranged authorization by both the payer and the payee.

Ultimately Databanks plans to provide checkless money transfer for both debits and credits and above all a communications system between debtor and creditor.

The most important decision which made all this possible and simplified interbank transaction

processing was the adoption of an account numbering system based on a single customer number, so that all accounts for any one customer are grouped in a single file.

Gordon Hogg, the guiding spirit of the enterprise, is openly working on extension of the automatic transfer into a checkless society environment. He envisions a society where everyone has access to terminals. People will then be able to buy anything they want, wherever they are, by computerized credit. Merchants will simply debit an account through a terminal for any goods or services purchased.

"People have been taken for a ride by the computer companies long enough, there's no doubt about it." And he goes about energetically proving what can be done.

Mowing Maneuvers

CW European Bureau

HAVANT, England — Mowing the lawn is for many just one of the chores that ensue that the weekend cannot be fully enjoyable. But for a town council it is much more. It becomes a major headache to efficiently maintain several thousand small areas of grass of all shapes and sizes spread over the entire area of a town.

Havant, a fast expanding industrial and residential district in the Solent City area of England's south coast, has an annual bill of \$53,000 to dispatch numerous lawn mowers and gangs. The council is using its Honeywell H125 computer to run an adopted version of the Fletcher, Clarke and Wright algorithm for vehicle scheduling to produce daily work schedules for at least some of its force of 20 grass cutters. It is already investigating using the program for similar problems including the exactly opposite problem of road sanding during the winter months.

Secret Report Asks Strict Rules For Police Computer Data Banks

(Continued from Page 1)
tremely valuable to the police, for example, by supplying additional information quickly to clear innocent people and reduce the number of suspects in an investigation, the report states.

But the report also warns, "There is an equally urgent need for security and privacy for such systems to protect the constitutional rights of citizens." Police departments, it notes, are often "willing or even eager to share information" and computer networks will sharply increase the flow of shared data.

These computer networks will also increase the security problem. "Under a manual system, information on an individual might be obtained from a police

department by a person who had no legal right to receive such data... But it would be an impossible task to query every police department in the country to find one with information on that individual.

"However, putting all available information about that individual into a national computerized system at least solves the collection problem for the person improperly seeking information. If he can find a way to obtain access to the computerized files, then he can get everything he wants."

Intelligence data on potential troublemakers plays an important part in police computer systems, and will be discussed next week.

New HIS 105 Falls Between 58, 115

(Continued from Page 1)
Mbyte disk system rents for about \$3,700/mo. An entry-level 105 with 16K, 9.2 Mbytes of disk memory, line printer and card reader leases for about \$1,700/mo on a one-year lease. There is no pure card-oriented 105.

Both System/3 and the 105 use RPG II, a more modern version than the 360/20 uses, but Sys-

tem/3 does offer conversational Basic.

A System 3/10 with 16K, 9.8 Mbytes of disk (maximum on the 3), 300 line/min printer, and a multifunction card unit which reads 250 card/min and prints 60 card/min, rents for \$1,740.

Prices on the CPU are \$25,870 to \$57,200, depending on memory size, and the basic disk subsystem costs \$20,460.

Explore the world of data base.

NAME _____

COMPANY _____

TITLE _____

ADDRESS _____ CITY _____

STATE _____ ZIP _____ PHONE _____



Cincom Systems Inc. We create efficiency.

we QUIET 'em all!

• There is a GATES ACOUSTINET handsomely designed to quiet any type of business machine. You name it—teletypewriter, automatic typewriter, key punch or accounting machine—GATES will QUIET it!

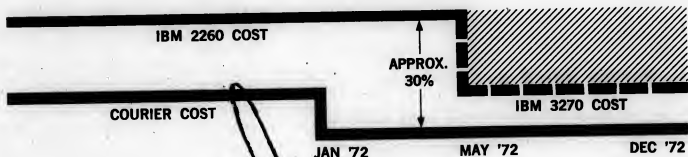
• Operator accessibility is given top consideration as well as maximum sound control.

• To learn how you can place your formerly noisy units where you wish—simply call or write:

GATES ACOUSTINET, INC.

THE QUIET SOLUTION FOR NOISY BUSINESS MACHINES
P.O. Box 1406-CW, Santa Rosa, CA 95403
Phone (707) 544-2711 • Telex 34-0376

Where do you stand in the 3270 delivery cycle ... and what will it cost you?



Courier
can deliver
NOW
at
lower cost
and
use your
2260
software!

If you're thinking of waiting for IBM's recently announced 3270, it may be well to pause and consider what the *real* cost may be.

The cost in time is obvious. Deliveries of the 3270 won't start until the middle of next year. Courier is delivering Executerm 60 and 260 Series CRT Terminals now.

The dollar cost is even more obvious. Courier is priced below today's 2260/65, and will be at least 10% below the 3270 when it is available. You save with Courier now, and while you are waiting for the 3270. It adds up.

The largest savings, perhaps, will be in software. Courier is, and always has been, fully IBM 2260 software compatible.

For detailed information call or write any of our regional offices, or Courier Terminal Systems, Inc., 2202 E. University Drive, Phoenix, Arizona 85034. Phone (602) 258-7271.



Courier
Terminal Systems, Inc.

A SUBSIDIARY OF BOOTH COMPUTER CORPORATION



Regional Offices
Los Angeles, Ca. (213) 380-5500

Rockville, Md. (301) 424-8088

Dallas, Texas (214) 233-5063

New York, N.Y. (212) 697-2332

Park Ridge, Ill. (312) 696-0980

Lack of Funds Cited

N.Y. Vetoes DP School Bill

By Joseph Hanlon
CW Staff Writer

ALBANY, N.Y. — Strict regulation of computer schools was vetoed last week by Governor Nelson Rockefeller on the grounds that the state did not have the money or manpower required to police the schools.

The regulation would have required schools to clear their advertising with the Commissioner of Education, and would have required the schools to post \$25,000 bond.

The bill was unusually broad, covering "schools offering computer training in such areas as clerical, keypunching, programming, computer operation, systems analysis, computer repair

maintenance, and customer service."

Computer schools would have been placed under the control of the Department of Education, and in his veto message the governor noted that the department had recommended veto because of the "absence of budgetary support." No one at the department would amplify on the governor's statement.

Assistant State Attorney General Stephen Mindel, who wrote the proposed law, said he was continuing to receive complaints from students about closings of computer schools, and that legislation in this area is "vitally" needed.

Despite the veto, he said, his

office would continue to investigate computer schools.

Under the proposed law, the Department of Education would also have been required to approve curriculum and equipment of the schools.

Computer school directors and teachers would have been required to have state trade school licenses. A trade school director must have five years of professional experience and take a 15-hour course from the State Department of Education.

Teachers are required to have passed four education courses, but can get temporary teaching permits as long as they take one education course per year.

NCIC Record Ruled as 'Probable Cause'

[Continued from Page 1]
offense. While there, the officer received his reply from NCIC, revealing that the vehicle was listed in the computer as stolen.

The FBI was notified, and the arresting officer and the FBI agent searched the vehicle. Evidence found in this search was used in the prosecution for violation of the National Motor Vehicle Theft Act, with the defendant being convicted.

Appealing the verdict, the defendant said two distinct and illegal searches had been made, and claimed the trial court had erred in allowing presentation of the evidence from those searches.

The first illegal search, he claimed, was when the officer copied the VIN from the dashboard. The second, he claimed, occurred when the two police

officials searched the car at the sheriff's office.

Copying the VIN was declared legal, as it was "clearly visible" to the officer when he approached the car, the FBI reported.

The examination of the car was declared legal because it was based on "probable cause," which had been supplied by the NCIC report.

Figures Don't Figure in Contest

By Thomas J. Morton
Special to Computerworld

CHICAGO — It has finally happened. Now America's most favorite and best understood spectator sport, girl watching, has been computerized.

Unfortunately, more enthusiasm than programming skills went into the computer room. One hundred and five girl watchers here were asked to submit specifications on "The Girl I would Like to Watch Best," and an IBM 360/50 was to have come up with the alphabets of Miss Best Girl To Watch.

The "walk-by" was conducted on Michigan Ave., drawing a goodly crowd of both the seasoned girl watching professionals as well as tyros and amateurs to the sport. A group of six judges was to have selected the winner. Girls did not have to enter the

contest, they merely had to walk by.

Seven young ladies in various stages of the latest mini-fashions were corralled by eager reporters as possible winners.

No one won. The computer, analyzing the 105 submitted written specifications, stated with "infallible accuracy and impersonal objectivity" that, to wit, a young lady (18 to 28 years of age) should have blonde hair, blue eyes, a summer sun tan, a 36D bust, an 18 inch waist, a sturdy 36 inch hip measurement, and legs five feet, four inches long.

A member of the Programming Committee explained to CW what he thought had produced the monstrous results.

"The input data forms," he said, looking around nervously, "not unlike a man fearing a lynch mob," "were totally inaccurate, totally incomplete."

News Wrapup

Location Debate Stalls DP Funds

COLUMBUS, Ohio — A disagreement between two universities on the location of a proposed \$2 million northwest Ohio regional computer center has resulted in a temporary lapse of funds appropriated for the project with the expiration of the fiscal year.

But the University of Toledo and Bowling Green State University are now in "comprehensive informal agreement" on locating the center on campus off by the Owens Illinois Corp. and on the joint use of DP equipment, said Dr. John Millett, chancellor of the Ohio board of regents. The legislature is expected to favorably view the request for funds as soon as a formal agreement is reached, he added.

Pupils Use DP Class to Educate Shoppers

JACKSON, Mich. — Although local grocery stores may not be posting unit prices, students in a computer science class at Parkside High School are moving to help customers shop comparably.

Brent Wile and Jim Nelson have devised a chart involving 1,300 calculations concerning prices and ounces. By glancing at the chart, shoppers can determine which items are economical. The students plan to distribute copies of the chart through supermarkets.

'House Swap' Suggested as Pollution Solution

WHEATON, Ill. — If everyone walked to work, air pollution and traffic congestion would be reduced significantly, claims James Ashenburt. To make this possible, he is planning to offer a computerized "house swapping" service to enable people to relocate near their work.

Eastern Doctors Get On-Line Reference Tool

SYRACUSE, N.Y. — Medical libraries in the Eastern U.S. have an online reference tool in the central computer at the state university here.

Twenty-two such terminals are connected by telephone lines to the university's Biomedical Communication Network headquarters where more than 1.5 million articles and citations in books and other publications are listed in the data bank.

Using the system, doctors and researchers obtain up-to-date replies as they need them, not two weeks later, as occurred previously.

Students, Not Computer, Schedule Courses

WALNUT CREEK, Calif. — It may be the computer age, but students at Amador High School would rather make their own course schedules than have them processed by computer as in the past.

Students have made up their master schedules for the coming school year, and will confirm their choices of teachers and hours during a two-day session in the gymnasium, where they will talk with the faculty. This method is expected to result in more students and less expense to the school, according to Principal Ned Sweeney.

Computer Delves into District's Dog Dilemma

OAK PARK, Mich. — This town has either fewer dogs or fewer dog licenses, or both, and a computer is being used to find out just where the decline really occurred.

When the period for renewing dog licenses expired recently, there were only about 1,700 tags issued for the new year, as opposed to over 2,300 for 1970.

Town police used a computer to discover which owners failed to renew licenses for dogs they still owned, and the town will collect a \$1 fee for each such omission.

'Data Punch' Pals Sends Sympathy Message

MONTREAL — Computers seem to have a "fraternity" of sorts. After the Sun Life Assurance Co. here told policy holders their letters would be answered by humans, not by computer, the company received a packet of punched cards. When processed, the message from Computer 001-001-001 expressed sorrow that "life for you may not be as full and rewarding as it is for me." It also invited the Sun Life computer to become a "data punch" pal.

COMPUTERWORLD

THE COMPUTERWORLD FOR THE COMPUTERWORLD
TM REG. U.S. PAT. OFF.

ROBERT H. PATTERSON, executive editor; V.J. PARKER, news editor; RONALD A. FRANK, technical editor; E. BRAD LUNDIN, JR., computer industry editor; EDWARD BRIDE, LESLIE PLANK, BAR, JOSEPH HARLOW, DONALD LEAVITT, MICHAEL MERRITT, staff writers; MARY O'NEIL, copy editor.

ALAN DRATTEL, Washington bureau; J.N. BONNETT, European bureau; NEAL WILDER, national sales manager; DOROTHY TRAVIS, sales administrator; FRANCES SHIMM, SKV, market research.

LEETE DODD, production manager; HENRY FLIN, production supervisor; MARSHA BRENNER, advertising copy co-ordinator.

EDITORIAL OFFICES: 797 Washington St., Newton, Mass. 02160 (617-332-6000; TWX 710-333-6403). Washington: 1601 Washington St., Waltham, Mass. 02154 (617-332-6000). Europe: Computerworld, Inc., 28 E. Chestnut St., Chicago, Ill. 60611. ©1971 by Computerworld, Inc.

Second-class postage paid at Chicago, Ill. Published weekly except double combined issues for the last week in December and first week in January by Computerworld, Inc., 28 E. Chestnut St., Chicago, Ill. 60611. ©1971 by Computerworld, Inc.

Reproduction of material appearing in Computerworld is strictly forbidden without written permission of the publisher. All requests to publication manager. 25 cents a copy; \$9 a year, \$16 two years, \$30 three years in U.S. Add \$1 per year for Canada. Other foreign rates on request. MAILING PERMIT: 610, circulation manager. (For weeks' notice required for change of address. Address all subscription correspondence to circulation manager, Computerworld, 797 Washington St., Newton, Mass. 02160.)

W. WALTER BOYD, publication manager; PATRICK L. McGOVERN, publisher.

POSTMASTER: Send Form 3576 (Change of Address) to Computerworld, 797 Washington St., Newton, Mass. 02160.

SEARCH HERE TO ENTER YOUR SUBSCRIPTION			
<input type="checkbox"/> 1 year - \$8* <input type="checkbox"/> 3 years - \$20*		<input type="checkbox"/> Payment enclosed <input type="checkbox"/> Bill me	
<input type="checkbox"/> New subscription <input type="checkbox"/> Change of address			
*Add \$1 per year for Canada. Other foreign rates on request.			
Please Circle 1 Number in Each Category YOUR INDUSTRY OR FUNCTION			
01 Mining/Construction 02 Manufacturing (computer or data system) 03 Manufacturing (general) 04 Utility/Transportation 05 Wholesale/Retail 06 Finance/Insurance/ 07 Real Estate 08 Consultants/DP 09 Services 10 Engineering Services (except CP) 11 Education/Medical/ 12 Government/Military 13 Communications/ 14 Publishing		01 Operational 02 Management 03 Engineering 04 Professional 05 Corporate 06 Office 07 Engineering 08 Scientific/R&D 09 Production/ 10 Maintenance 11 Sales/Marketing 12 Librarian/Educator 13 Other	
First Initial Middle Initial Surname Your Title Company Name Send to: Address City State Zip Code	Address shown is: <input type="checkbox"/> Business <input type="checkbox"/> Home		

Computer and Poet

Chances Are, the Poems Will Be 'Chance'

By Phyllis Huggins

Special to Computerworld

LOS ANGELES, Calif. — Jackson MacLow, distinguished poet, and Information International Corp. (II) have teamed together to create poetry as part of a Los Angeles County Art Museum program on art and technology.

MacLow is a "chance" poet, one who assembles groups of words and ideas and then selects the parts randomly.

A Poem

The earth turns.
The stars shine.
The earth turns, the moon shines.
The stars shine.
The moon shines.
The earth turns. The sun shines.
The streams flow.
The rain falls.
The oceans fall, the oceans rise.
The snow falls.
The wind blows.
The river flows...

An "artist in residence" at the company for two months, MacLow completed 19 poems during this period, each one of them constructed differently.

To add a dimension to the poems, II put an audio unit on its display system so that while the computer was randomly selecting the parts of the poems and displaying them on the CRT unit, the

audio was creating music generated by the lines of poetry.

For example, the longer the series of characters, the deeper the audio tones and the longer the duration of the tones.

According to MacLow, his poems created a "pipe organ-like" music. John Hanson, director of programming at II, said the real work of art was watching the artist seated at the display console in a darkened room with the poems being created live before him on the CRT and accompanying music in the background. "It was a beautiful, stunning effect," said Hanson.

Poetry has been generated by computer before, but it was by technicians using technology to produce "art" resembling results. This is probably the first case of a poet bridging the gap of technology and using it to create his own form of poetry.

The differences in the types of poems that resulted is shown by excerpt:

Dazzling biologists diagrammed donbunny expressions.
Determined pigs feathered linnæan linterils.
A dashing highwayman dealt with funny processes.

A distracted wintener sailed phantasmic petals.

Disgusting fictions coaxed loony fishes.

Dian Warkoski silvered playing lions sincerely.

A director filed dead Schnauzers hysterically.

Decent people picked real mountebanks as leaders.

A duck distinguished peanuts daintily in Jersey.

Diddling fijians thanked cranky westerners.

Delighted fiddlers practiced drunken scales.

Sturdy branch on the family tree.

The DM-314 Disk File System is the founder of a family line of Disk Drives from Ampex, the computer peripheral company.

Plug interchangeable for IBM 360 and 370 systems, completely compatible with IBM in format, density, variable record, programming and diagnostics.

Nearly twice as fast as the disk file it replaces... average access of 32 milliseconds, minimum access 8 msec, maximum 58 msec, using IBM 2316 or equivalent disk pack. Reliable voice coil head positioning.

As part of the Ampex family of computer peripherals, this disk drive and controller are backed up with worldwide installation and maintenance service.

We have a brochure that details just how much the Ampex Disk File System can increase the efficiency of your IBM operation.

It's an important addition to our family album. For your copy call or write Ampex, Computer Products Division, 9937 West Jefferson

AMPEX

Boulevard, Culver City, California 90230,
(213) 836-5000.

Illinois Units Hits \$6 Million Underuse Of Computer Centers

By a CW Staff Writer

SPRINGFIELD, Ill. — A state finance department study of computer operations at the 13 major Illinois state universities showed \$6 million of an annual \$20 million equipment rental expense is being wasted, according to the acting director of the state finance department, John W. McCarter, Jr.

An investigation by the finance department was made at the request of Rep. David J. Regner (R-Mt. Prospect), chairman of the house appropriations committee.

The majority of the \$6 million waste, the study revealed, is caused by rental of allegedly unused equipment. Northern Illinois University at DeKalb, the finance director stated, showed a 70% use of its rented equipment.

He credited the waste to the lack of central planning or control over acquisitions and use of computers at the 13 major campuses. His study team had difficulty finding accurate lists of equipment on the campuses, Regner stated.

State universities in Illinois include the University of Illinois at Champagne-Urbana, the site of the development of Illic III and Illic IV.

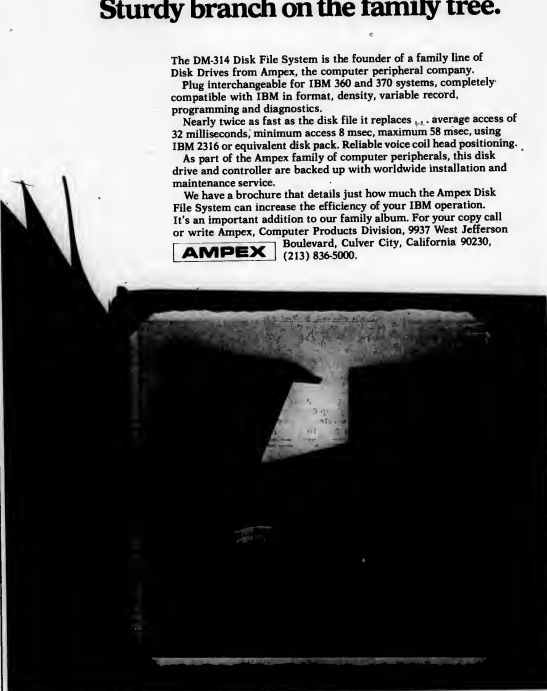
The state board of higher education has frozen computer acquisitions for the next six months, pending review of the campus situation by the board's staff in conjunction with outside consultants.

3½ Years for Hospital System

BIRMINGHAM, Ala. — Carraway Methodist Hospital here has completed phase one of its computer-based patient-care hospital information system, when admissions, discharges, transfers, and reservations were placed on a computer system.

Three and a half man years were spent in developing this phase of the hospital's overall program, according to local officials.

Ultimately, the goal is to have computer terminals on all nursing stations.



WE
BUY • SELL
NEW-USED
TELETYPES®
• Any Model
• Any Condition
EASTERN DYNAMICS CORP.
1100 Suffolk Ave.
Brentwood, N.Y. 11717
616-231-8800

360 Model 65 and 50's
Available
One Year Lease
Fantastic Savings
D. Geelan
Yale Industries Corporation
299 Madison Avenue
New York, N.Y. 10017
(212) 867-4947

To Prevent War?

Researchers Use DP to Assemble, Correlate War Data

By Thomas J. Morton

Special to Computerworld
ANN ARBOR, Mich. — Since 1871, only 24 years were without a war, says a computer-generated study of war that will be soon published in book form. The study indicates 93 wars were fought between 1916 and 1965.

Predictable Factors

The purpose of the study is to determine predictable factors of wars, base root causes and consequences so a computer can be used to predict warfare-like tendencies by an analysis of the current factors of any given group of people, explained project leader J. David Singer, University of Michigan.

Wars should be predictable in the same manner as storms, Singer said.

In time, the researcher noted, wars could be prevented by knowing how they start and moving to prevent the build-up of factors that lead to the shooting.

Mathematics and computer analysis is being used in this study because of criticism that social science research is "fuzzy" and lacks "scientific rigor," Singer said.

Some Unstified Criticism

But the researcher contends that the use of computers has not stifled all criticism. There is a controversy developing that claims something as complex as

war and its root causes cannot be reduced to simple numbers, he noted.

Singer admits some subtlety and "some of the complexities" are lost with quantitative analysis, but maintains that previous research on war adds up to "942 linear feet of delightful and plausible speculation on the causes and the consequences of war... and there's not a damn shred of reproducible evidence." The researchers have produced a statistical picture of war, determining:

- A total of 144 nations spent a 4,500 "nation months" in combat and suffered 29 million battle deaths, not including civilians.
- An interstate war began

every 3 years and a colonial, or imperial, one every 3.5 years.

- There were 6.2 wars in the average decade, with peaks in the volume of war every 20 years.

• Most wars began in spring or autumn, generally April or October, but the longest and bloodiest wars all began in summer months.

• Europe was the area most prone to war, with the Middle East running second.

• England and France were tied for fighting the most wars (19), with France losing more than her neighbor across the channel.

Using a statistical base, the researchers are developing a

comparable picture of other social, economic, and political conditions and events to determine which are most regularly associated with periods and places having the highest and the lowest flare-ups of fighting.

Behavioral factors also were being studied. These were the hardest to equate to quantitative analysis, and required complex programming using code numbers for each kind of action, Singer said.

Other socio-political scientists involved with the project are: Dr. Melvin Small, Wayne State University, Dr. Stuart Bremer, Michigan, Dr. Russell Leng, Middlebury College and Dr. Michael Wallace, University of British Columbia.

Take
a
ballpoint
pen
and
simply
solve
your
input
problem

General

Researchers at GE's Ballpoint Development Center winged in the interactive graphic techniques, background, and so on. They commented a Grid/Pen system to their graphic terminal.

Grid/Pen is a ballpoint with a difference. It uses a tiny speaker that sends sound signals to reply to strip microphones that record x and y coordinates. Because sound is used, data input is very simple. No software, no costly interfaces, none of the start-up problems often associated with graphic input.

If you have a data entry problem involving written, drawn, formatted or graphic information, chances are that Grid/Pen can help solve it. Simply.

Let us hear from you.

Please send me more information. I have an input problem I want to solve, simply, in the following application area:

Name _____
Title _____
Address _____
City _____ State _____ Zip _____

GE RESEARCH & DEVELOPMENT
100 Shaker Street, Burlington, Conn. 06810
Telephone: 860-582-1000
Inquiries to: Application Dept., 1 North Avenue, Princeton, N.J.

DPers Among Political Contributors

By a CW Staff Writer
WASHINGTON, D.C. — Four

AGENTS WANTED

We are looking for established firms with proven marketing and technical ability to market a highly successful, nationally advertised software product on an exclusive territorial basis. Full product support will be supplied. Please reply to:

CW BOX 3418
60 Austin St.
Newtown, Mass. 02160

computer company heads and one inventor were the only computer people to contribute more than \$25,000 to political campaigns in 1968, according to a list compiled by the Citizen's Research Foundation, Princeton, N.J.

The chief surprise on the list is Dr. Manfred Clynes, director of the Biocybernetic Laboratory at Rockland (N.Y.) State Hospital, who contributed \$30,000 to Eugene McCarthy.

'For Peace'

Clynes, told the New York

Times he made his money through the invention of medical computers, and that his "first and only political contribution was for peace."

Other contributors were: Sam Wyly, president, University Computing Co., \$100,000 to Republicans.

Arthur K. Watson, as chairman, IBM World Trade Corp., \$34,875 to Republicans.

Howard S. Levin, ex-president Levin-Townsend Computer Corp., \$30,000 to Democrats.

Thomas J. Watson Jr. as chairman IBM, \$28,875 to both parties.

Beer Gets DP Assist

LONDON — Guinness, the internationally famous beer, is moving into Nigeria with computer-powered assistance. Major extensions to the Guinness brewery in Lagos are being constructed under the control of a critical path network, established and updated monthly on an ICL 1900 Series computer at Baric Computing Services' (ICL's bureau subsidiary) bureau here.

MISSISSIPPI STATE CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the State Central Data Processing Authority, 508 Robert E. Lee Building, Jackson, Mississippi 39202, until 2:00 p.m., Monday, July 26, 1971, for the following data processing equipment:

Request for Proposal No. 40 — Lease or purchase of one (1) Typewriter computer terminal with 30 characters/second rated print speed and ability to print 132 characters per line.

Request for Proposal No. 41 — Lease or purchase of three (3) 110 baud and four (4) 2400 baud data communication modems.

Detailed proposal specifications may be obtained from the office of the State Central Data Processing Authority.

The State Central Data Processing Authority reserves the right to reject any and all bids and proposals and to waive informalities.

STATE CENTRAL DATA PROCESSING AUTHORITY
Charles L. Guest
Executive Director

TERMINAL CLEARANCE SALE

We have available for sale the entire excess terminal inventory of several companies. As a result we offer the following equipment for sale at substantial discounts:

- Teletype Model 35's
- Teletype Model 37's
- Teletype Inltronic's
- Acoustic Couplers
- Hard Wired Modems
- Datapoint 3300's
- Dura 1051's

These units are new or reconditioned and carry an unconditional warranty. These units will be available only while quantities last.

TERMINAL EQUIPMENT EXCHANGE

1137 Frito Lay Tower
Dallas, Texas 75235
(214) 358-5194

1130

COMMERCIAL PROGRAM SYSTEMS

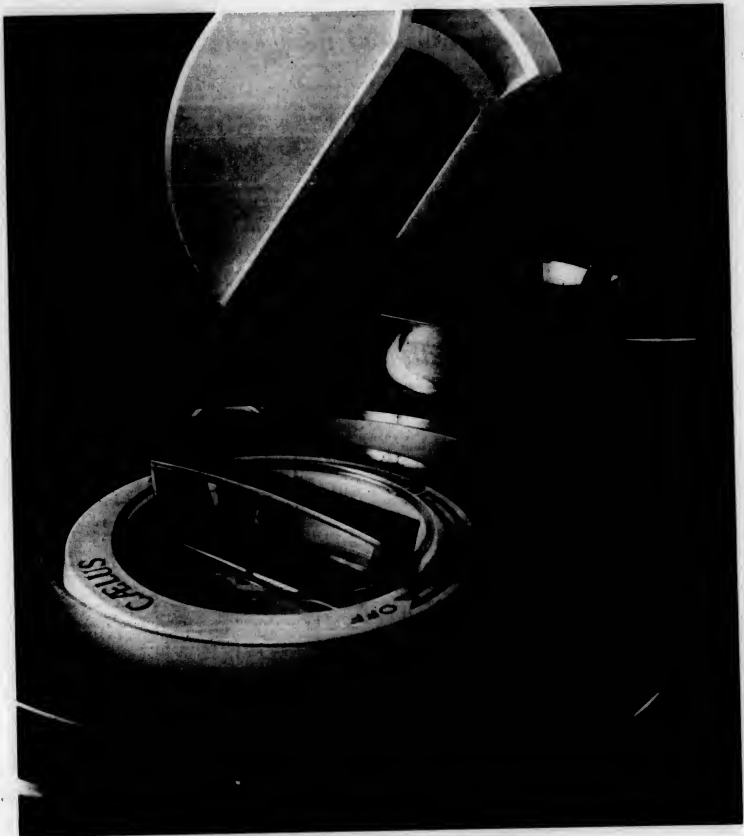
Accounts Receivable and Statements \$1500
Accounts Payable and Ledger \$1600
Distribution \$1400
Payroll \$1400

All systems work in B.C. Completely documented. 2 years of use in multiple installations. Variable length records. Complete edit checks. Control balances and audit trails.

Write or Call

TCS CO

Technical Computer Services Corp.
6200 No. Hiawatha
Chicago, Illinois 60646
(312) 286-5252
The Commercial 1130 Systems Company



Three insurance policies for your data

Single cartridge, six and eleven-high disk packs. Disk packs unsurpassed in workmanship

and performance — because each carries the unmistakable Caelus® trademark. We know of

only one way to make disk packs at Caelus; and that is the very best way possible.



CAELUS® MEMORIES, INC. P.O. Box 6297, San Jose, California 95133. Telephone (408) 298-7080

Editorial

Object Lesson

Minding your own business exclusively can be hazardous for your business — and expensive for others. DP people, both in service bureaus and in in-house installations, tend to think of their work in terms of processing information for others. It doesn't necessarily occur to them that others are depending on them to process the information in a legal manner.

The Federal Trade Commission has found that a number of merchants are violating the Truth in Lending Law because they depended on their DP people to see that their billing was legal. The DP people, apparently, expected that the users of their services would ask for changes when they were required by law.

Technically, the DP people may be right. But ethically they are wrong. And there is a good possibility that some of them will lose their jobs or customers before the dust settles.

It pays to mind your customers' business as well as your own.



Letters to the Editor

Hospital Cites Sharing Efforts

I read with great interest the article "DP Sharing Cuts Hospital Costs" (CW, June 9). The sharing discussed in your article is a large contribution to reduction of hospital costs.

We, in the Chicagoland area, have been sharing in the manner suggested in your article, but have been at it about a year longer than the Philadelphia hospitals.

MacNeal Memorial Hospital in Berwyn, Ill., has a computer installed which it shares with Illinois Masonic Medical Center in Chicago. The hospital has an 1,100 combined bed total. Much coordination has been exercised so that the two hospitals share in systems development effort as well as computer time.

Thomas W. Bradley, Director
Systems and Data Communications

MacNeal Memorial Hospital
Berwyn, Ill.

Pi Sort 2's Minimum is 24K

We were certainly pleased to find that Alan Taylor (The Taylor Report, June 16) found that our Pi Sort 2 substantially outperforms IBM's 483 Sort. However, the minimum configuration for Pi Sort 2 is 24K, not 50K, as was suggested. In addition, Programmatic is still supporting Pi Sort 1 (compatible with IBM's 450 Sort) which substantially outperforms the 450 Sort both above and below 50K bytes.

The statement, "... Pi Sort will not help those people who are wanting the best disk sort that they can get for free ..." is definitely true, and I can safely predict that Programmatic will not have any relief for those people in the foreseeable future.

David E. Ferguson
President

Programmatic, Inc.
Los Angeles, Calif.

Taylor replies: The question is, however, just how far below 50K partitions does Pi Sort outperform 483? As reader Spyridon Apostola pointed out, his tests at 32K indicated no clear result, leading him to the conclusion that "the new sorts are not written with an execution pattern of even 32K in mind" (CW, June 30). And, as far as performance is concerned I concur with him — even though the sort may function there.

Reader Suggests Isort for 2314s

In the June 30 Letters to the Editor, three out of seven people indicating their need of SM-450 support also expressed their desire to have SM-450 support 2314s.

Back around DOS Release 18, IBM had many 2314s installed and SM-483 was not yet available; as a temporary measure an interim sort was made available to support the 2314. The name of the sort was Isort and outwardly was identical to SM-450.

The installation I was with at the time ran Isort for about six months without any problems that I can recall.

I'm not sure who, if anyone, might still be running Isort, but it seems that it might be of value to some of the smaller-core 2314 shops.

Paul J. Horak

Chicago, Ill.

Ticketron Passed OTB's Tests

In the "Computer Betting Starts, Ticketron Enters Race" story (CW, June 30) a reader may construe restrictions and performance characteristics of the Ticketron system which are not true.

Based upon Ticketron's broad experience in sports and entertainment ticketing and with the New Jersey lottery, we were asked by the New York Off-Track Betting Corp. to propose an OTB system that would be operational quickly and would be capable of meeting all requirements.

Ticketron completed this system in 45 days and passed all OTB tests for performance criteria (auditing, speed, reliability, etc.) on the first try. We feel this was a remarkable achievement that attests to the expertise and reliability of Ticketron's technical staff.

As to performance, Ticketron's terminal is second to none. Both numerous tests and long operating experience in the field confirm that this is not a mere conjecture.

The system itself is expendable to any number of betting parlors, telephone betting, etc. The cost/performance ratio of Ticketron's system is superior to any available today.

Ticketron will be in the OTB betting market on an expanding basis because we believe it is an important one for us and an important source of revenue for municipal and state government. We are prepared to install and operate our system anywhere in the U.S. and we are now, in fact, having such discussions.

T.W. Heiwig
President

Ticketron, Inc.
New York

3735 Has April Delivery Date

In an article on programmable terminals, it was stated that the IBM 3735 Programmable Buffered Terminal "would not be delivered until the end of 1972" (CW, June 23).

As we said when the 3735 was announced, first customer shipments are scheduled to begin in April, 1972.

Chauncy I. Bartholoff, Manager
Terminals and Communications Products

IBM
White Plains, N.Y.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 787 Washington St., Newton, Mass. 02160.

Bill Seeks to Data Bank All U.S.-Funded Research

WASHINGTON, D.C. — With invasion of an individual's privacy being one of the hottest issues on Capitol Hill these days, the words "data bank" have fallen into ill repute.

The words connote an insidious invasion into the thoughts, ideas and personal lives of private citizens.

But data banks, of course, are not all bad, and now an Illinois congressman is asking the House of Representatives to consider approving establishment of a national research data bank.

Rep. Harold R. Collier (R-Ill.) believes the public should know where its money is going.

In fiscal 1972, which began July 1, the Federal Government will provide \$17.7 billion for research programs — better than \$1 billion more than fiscal 1971, Collier says. And many of the programs, he asserts, show costly overlapping between governmental agencies, private corporations, foundations, universities and individuals.

Inefficiency and waste caused by duplication and overlapping research efforts on a national level almost impossible, Collier contends.

"There are so many programs of research assisted by the Federal Government," he says, "that very few people in any division of government can answer the simplest request for information about any given program."

In a statement in the Congressional Record, Collier adds, "I am sure that every member of Congress has had occasion to request information on a research program only to find it was conducted by 10 different project directors under five different agencies."

"Sometimes the mystery of where, how and by whom con-

cerning research money appropriated by Congress becomes a major research project in itself.

"Year after year Congress has been asked to approve the funding of new ventures in research more thoroughly until there is a systematic way of maintaining and using the information that has already been gathered at federal expense."

Collier's bill, H.R. 9732, called the "National Research Coordination Act of 1971," would authorize the U.S. Comptroller General to develop and maintain a standard national depository for all information and data relating to research programs conducted with federal assistance.

The plan also calls for publishing a yearly catalog containing a summary of all information and data stored in the bank except for material that may be classified.

Section 4 of the bill provides that for each research program being conducted with federal assistance the data bank shall:

- Identify the program, including the name of the program, the authorizing statute, the specific administering office, and a brief description of the program and its objectives.

- Describe the program structure, including the method of research being utilized, and the expenditure patterns.

- Provide additional financial information, including current authorizations and appropriations of funds, the obligations incurred for past years, the current amount of unobligated balances, other non-federal sources of assistance including amounts, and other pertinent financial information.

- Identify the appropriate officials who are administering the program.

- Identify any closely related programs; and

- Provide any other information which the Comptroller General may feel is necessary to a complete understanding of the scope and purpose of the research program."

The Collier bill has been referred to committee.



After Taking Orders, IBM Cuts 155 Internal Speeds

When the new 370 line of IBM computers was announced last summer, the 370/155 was the clear leader of the fleet. It had a remarkably powerful performance. And it had clear signs that it was a real machine—not a paper tiger.

Demons were promised only two or three months after the announcement. Deliveries were promised for nine months. And both the promises were kept.

But now the question is what was demonstrated, and what was delivered as a result of all the orders obtained during this period.

For make no doubt about it, the 370/155 has been one of the most successful machines. Judging by the reports of *EDP Industry Report*, the respected sister publication of *Computerworld*, by April some 865 of these machines had been ordered.

And yet, at that time, there were no performance lists for the 155 officially released to customers.

Even though it had been delivered in February! Even though it had been demonstrated last August! Even though the internal performance of the system is the key measure of a computer!

Did Users Care?

Now that is not to say that all these millions of dollars worth

of equipment were ordered without some consideration of the performance. It is to say that IBM did not officially give them to the customers.

The facts were boldly stated in a memorandum from the Headquarters Field System Center in Poughkeepsie on July 8, 1970. Mr. J. Beckerling wrote: "No instruction timing sheets were included in the System 370 Model 155 manuals at announcement time. Preliminary copies of these are attached for your use. . . . These are not labeled IBM Confidential but you should use them with discretion and disclose this information only to those people with the need to know. Selected quotes of these times may be given to customer and included in proposals but the attached list should not be released."

The attached list of instruction times was then provided by IBM to be used to persuade customers to order the 370/155, although the corporation was not prepared to let the customer have the lists.

When the Orders Were In

Curious as this policy appears, it became even more curious in May this year when a technical newsletter was issued with the official times. The phrasing was somewhat different, the new one being in microseconds, and the other having been in machine cycles.

(The 155 machine cycle is .115 μ sec, so that the numbers have to be multiplied out accordingly.)

The first instruction listed was the ADD instruction. This was given as being 7 machine cycles, and so would have been expected to be .805 μ sec.

In the TNL it is .993 μ sec, up some 24%.

The next instruction, another ADD this time register-to-register, was originally 4 machine cycles, or .460 μ sec. This is a particularly interesting case, because there is no problem here about having to estimate the length of time it takes to get an item out of storage. The operands here are in the registers already so it is a very straightforward hardware function.

However, again the "New" Model 155 is slower than the original one with the time at .499 μ sec. Not so much slower this time, only about 7%—but still slower.

The next instruction on the lists was the ADD decimal. It was also slower now.

Analysis Started

By the time I found these points I was getting interested. So much so that I stopped the instruction-by-instruction examination, because this is always liable to produce a lost point of view.

Instead I started off doing classes of instruction by doing classes of instructions. I took the decimal instructions, which are so used in the commercial line. Then I took branch instructions which are an inevitable part of any program. I took these separately, whether the branch is taken or not.

And then I took other classes, like those that originally had three machine cycles, then four, five, six, seven, eight, nine, ten, eleven and twelve.

Most Cases Slower

I worked out in each case the old and the new 155 timings. There was one case—with 8 machine cycles—where the old ones were slightly slower than the new ones. In every other case they were considerably slower in the new timings. The results are shown in figure 1.

Which just raises the question, I wonder what the 155 will perform when it is delivered. And I wonder how anyone can

User's Stake \$4,200 Not \$5,000

In the *Report* "If These Terms Are Fair, Users Should Look Elsewhere," June 23, the *Information* charges that users have to pay to IBM if they opt out during a fixed-term lease were originally computed on the full rental figures, rather than on the reduced fixed-term rental figure. As a result, the charges were shown nearly 20% higher than they are. In particular, the \$5,000 rental termination charge for an IBM 370/155 should have been \$4,200.

However, as this amount is still larger than \$3,840, the maximum amount that a user can gain on the fixed-term lease, this mistake did not affect the argument that the odds—set by IBM—suggest that in fact it is more likely than not that a money-conscious user will find better values outside IBM. The error is regretted.

The 1970 155 vs. the New One

Instruction Types	Instructions Used	Performance Difference (%)
Decimal Instructions (15 digit operands)	Add, Subtract, Multiply, Compare	18 Slower
Branches Not Taken	BALR, BCR, BC, BCTR, BCT, BXHE	11 Slower
Branches Taken	BXLE	24 Slower
3 Cycle Instructions	ALR, CR, CLR, LR, LTR, LNR, SLR	15 Slower
4 Cycle Instructions	AR, LA, SR	8 Slower
5 Cycle Instructions	AL, C, CLJ, L, SPM, SL, SI	23 Slower
6 Cycle Instructions	NI, XI, IC, OI	52 Slower
7 Cycle Instructions	A, NR, XR, LNER, LPER, LE, MVI, OR, SSM, S	10 Slower
8 Cycle Instructions	LTER, LDR, LDRN, LPDR, LER	(6) Faster
9 Cycle Instructions	N, BAL, X, LTDR, LCEr, LDO	9 Slower

Figure 1. Table shows the difference between the instruction times originally authorized by IBM for release to customers and inclusion in proposals for the System 370/155, and the instruction times of the same systems as published by IBM in May, 1971.

Oh—and if you think IBM stands behind its proposals to its customers, you should just look at the typical IBM contract forms. If proposals are mentioned—they are specifically excluded as being any part of the agreement!

tell whether his 155 will really be giving him the performance that he is paying for, when IBM is able to change its published instruction times after taking orders.

In this another type of concealed price increase that we have to put up with? Why do businessmen allow million dollar pieces of equipment to be de-

graded, when our wives have been able to stop supermarkets pulling the same trick on dollar items?

© Copyright 1971 Alan Taylor. Reproduction for commercial purposes requires written permission. Limited numbers of copies for non-commercial purposes may be made provided they carry this copyright notice. The views expressed in this column do not necessarily reflect those of Computerworld.

IBM


Headquarters Field System Center

July 8, 1970
Dept. H74 - Bldg. 985
P.O. Box 590
Poughkeepsie, N.Y. 12602
Tel.: (914) 488-7118 or
te line: 255-7148

SUBJECT: Instruction Execution Timings for System/370 Model 155

MEMO TO: SE & I Managers

No instruction timing charts were included in the System/370 Model 155 manuals at announcement time. Preliminary copies of these are attached for your use. They have already been distributed to the Regional Product Marketing people. This is the best information available at this time. TNL's will be made available shortly firming this up and converting the timings to microseconds rather than CPU cycles.

These are not labeled IBM Confidential but you should use them with discretion and disclose this information only to those people with a need to know. Selected quotes of these times may be given to customer and included in proposals but the attached list should not be released. Any questions on this information should be directed to Bob Shomler (914) 488-7159 or te line: 255-7159.

J. Beckerling
nm

cc: FSC Managers
Mr. R.W. Shomler
Mr. R.K. Sturcken
att.

Figures 2. Beckerling's letter of July 8, 1970 instructing IBM non-confidential data to be kept out of the hands of customers, but used for proposals etc. The TNL referred to was published 10 months later, in May, 1971 and the timings generally were slower than Beckerling quoted. (Letter reprinted for purposes of clarity.)

buy, sell
lease or
sub-lease

WE PUT IT ALL
TOGETHER

LEASE

651/H - 60%

50H/HG/I - 70%

40G - 80%

COMPUTER MARKETING INC.

FREE Computer Marketing Bulletin
of Second User IBM 360 Equipment Available for Sale or Lease

IT'S SIMPLE!

THE **ONLY** INTEGRATED system providing COBOL pre-processing, COBOL macro expansion, and direct access source maintenance. (OS and DOS). It's so easy to use, it had to be called—

SIMPLE!

Contact Ron Laubert
Computer Services Corporation
23225 Northwestern Hwy.
Southfield, Michigan 48075
313/444/5030

Day in, day out, year in, year out
Computer time is our business

tbi

TIME BROKERS, INC.
500 Executive Boulevard
Elmford, N.Y. 10523
(914) 592-4065

The only national brokers of computer time

Atlanta Boston Chicago Los Angeles Philadelphia
Baltimore Washington, D.C.

LOOKING FOR THAT FLEXIBLE DATA BASE STRUCTURE?

Take a look at our Last Management System. LMS solves that difficult application problem by providing you with the ability to create data stacks, multiple threaded lists, repeating groups, tree structures or network file structures.

As a special introduction this system will be offered in the month of July for only \$5,000.00. For further information write or call



J.E.C. Shultz

JEFFERSON FINANCIAL SYSTEMS INC.

177 North Franklin Street Chicago, Illinois 60606 312/373-8414

For a company that grosses almost \$3 billion a year...

BASF works mighty hard to save a few bucks for its customers

We may be one of the world's largest companies, but we realize that size brings its own peculiar responsibilities.

That's why we spend so much time and money making sure that critical EDP products like BASF disk packs are the most reliable that technology can produce... at a price considerably below what you're used to paying.

We never forget that growth cannot be maintained without genuine concern for the needs of every customer, large or small. Let us show you how the industry's finest disk packs and computer tapes, backed by a company that cares, can help make your life a little bit easier. Contact your nearest BASF Systems office, or write BASF Systems Inc., Crosby Drive, Bedford, Mass. 01730. Tel: (617) 271-4000



BASF



BASF SYSTEMS INC.

BASF Systems Inc. is a wholly-owned American member of the BASF Group

First Latin American Exposition

Mexico City to Host Five Day DP Meet

By a CW Staff Writer
MEXICO CITY - A five-day computer exposition scheduled here at the end of the month includes three days of technical sessions.

The first International Computer Exposition for Latin America is to take place July 26-30, with an accompanying Random Access Forum July 27-29. All events take place at the Camino Real Hotel.

About two dozen exhibitors, including some of the largest U.S. manufacturers, have signed up for booth space, and the exhibit area will be open to the public at no charge.

The technical forum is divided into three segments by intended audience: corporate executives,

EDP managers, and general interest.

The sessions for corporate executives will include a luncheon address by Patrick McGovern, president of International Data Corp. His address will concern

Societies/ User Groups

the development of computer usage in America, and its implications for Latin America.

Fee for the high-level management seminar is \$256.

The Systems seminar, for EDP managers, will cost \$144, and will feature lectures on applications of current technology, in-

cluding time-sharing, graphics, optical scanning, and numerical control for industry.

The general-interest portion ("applicable science"), which will feature discussions on computer assisted instruction, engineering applications, traffic control systems, and mathematical models for management, will cost \$72.

Simultaneous translation equipment will be used during the lectures. Attendees will be given special rates at the Camino Real Hotel, if they mention the exposition in their communications.

More information is available from Exhibition Management Inc., 40 West Ridgewood Ave., Ridgewood, N.J. 07450.

Cost Effectiveness Topic of ACM Seminar

CHICAGO - A management seminar entitled "Computing Today: The Profit Crisis" will be conducted by the Association for Computing Machinery (ACM) at the conclusion of its national convention in August.

The two-day seminar, Aug. 6-7, will be given at the Conrad Hilton Hotel.

The seminar will provide lectures and workshops to give "real answers and practical solutions" to the problems of keeping computer operations profitable, an ACM official said.

Dr. Anthony Ralston, chairman of the computer department at the State University of New York at Buffalo, will cover data communications and system performance measurement.

Dr. Robert Rector will chair the Saturday session, which will deal with personnel evaluation and training, the bottleneck of "input economics," data security, and software buying. Fee schedules and other information are available from ACM at 1133 Avenue of the Americas, New York, 10036.

Ifip 71 Doing Well

NEW YORK - Preliminary advance registration figures for Ifip (International Federation for Information Processing) Congress '71, to be held in Ljubljana, Yugoslavia, August 23-28, reveal the U.S. and U.K. lead in registrants - followed by Hungary as a surprisingly close third.

Of the 1,500 advance registrants to date, a little over 10% are from Hungary.

The pace of advance registration, according to Ifip officials, is ahead of the last Ifip Congress. Ifip can be contacted through Box 4197, Grand Central Post Office, New York, 10017.

Digitronics Users Group To Hold 6th Annual Conclave

TYSONS CORNER, Va. - The Digitronics Users Association (DUA) will hold its 6th Annual Conference here on October 18th and 19th.

The agenda includes seminars on the impact of point-of-sale data acquisition on retailers, wholesalers and manufacturers, maximum utilization of data communications networks, certification as a solution for coupling and interconnect, data communications systems organization, and a presentation of the potential problems of incompatibility among the new digital networks.

Among the panelists are: Harry Schreiber Jr., Bernard Strasberg, James L. Clark, and Donald L. Dittberner.

July 14, 1971

Page 11

Random Notes

IBM Will Give 155 Users Free 7070/7074 Emulator

WHITE PLAINS, N.Y. — IBM will add 7070/7074 OS emulation to the 370/155 through a no-charge program scheduled to be available in the first half of 1972.

The emulator will provide tape formatting programs for converting 7070/7074 tape files into standard OS format and will require a minimum partition of 188K bytes on the 155.

GTE T/S Boasts APL Version

WHITE PLAINS, N.Y. — GTE Data Services has added a new version of APL/360 to its timesharing capabilities. Called APL-XB, it allows users to access OS compatible disk files and then generate disk files of any specified size. A separate edit feature allows users to edit numeric data and generate reports in up to one-tenth the time previously required. GTE

The service costs \$1.1/hr connect time and \$6/min for additional CPU time. GTE Data Services is at 2 Corporate Park Drive, 10604.

Payables Package Runs on P-350s

NEW YORK — Philips Business Systems Inc. has an accounts payable package for users of P-350 minis.

The package is said to enable small and medium size businesses to exercise control over expenses with routines for posting vendor and distribution ledgers, preparing vouchers and checks, and compiling management reports. The software prepares a daily total sheet of debits, credits, discounts and checks written. Philips is at 100 E. 42nd St., 10017.

CSS Packages Aid Engineers

STAMFORD, Conn. — Two new civil engineering packages are now available on the National CSS timesharing network.

The logo (Integrated Geometry) system developed by Omnidate Services Inc. can identify, store, retrieve and compute points, bearings, and elevations for mapping, road and bridge design, subdivision layout, and related two and three dimension problems.

The Sewnet package, also from Omnidate, is for designing, cost estimating, and profile plotting of sanitary sewer systems. National CSS Inc. is headquartered at 460 Summer St., 06901.

EMR Has Seismic Enhancement

MINNEAPOLIS, Minn. — EMR Computer's Executive Job Processor package is for geophysicists analyzing seismic data.

The package, an enhancement to Seismic Processing System (SPS) is available free to all EMR 8000 SPS users from 8001 Bloomington Freeway, 55420.

HIS Has Scheduling Systems

WELLESLEY HILLS, Mass. — The Honeywell Production Scheduling and Control System I (PSC/I) provides scheduling, loading, control and reporting capabilities for manufacturing users. The system operates with an HP115 CPU or larger.

A second system, PSC/II, operates with HIS models 1015 through 4200 and also has PERT scheduling capabilities. It requires 98K with tape, disk, card reader, and printer in minimum configuration on the 1015.

30% Less Core Needed**ADR Claims 'Roscoe' Superior to CRJE**

By Don Leavitt

CW staff writer

PRINCETON, N.J. — While current and potential users of remote batch processing on the 360 can use IBM's Conversational Remote Job Entry (CRJE) system, a much better choice might be the Remote OS Conversational Operating Environment (Roscoe) from Applied Data Research Inc.

ADR recently spent three months comparing the two systems.

Both packages were tested on ADR's 360/50. The characteristics analyzed by ADR included facilities needed, ease of use, core and disk requirements, operating speeds, degradation of the operating system and cost factors.

The study found that Roscoe and CRJE

have 19 facilities in common. CRJE has seven features for which Roscoe has no counterpart, but Roscoe has 20 unique features.

ADR recognized the CRJE PL/I scanner as significant, but said its other features are "essentially programmer conveniences." Roscoe features include the Basic language, a Cobol syntax checker and others ADR said are designed to increase programmer productivity and make the system attractive to non-programmers.

The study indicated Roscoe normally required 30% less core and 60% less disk space. A Roscoe system without syntax checkers supporting five terminals requires 50K bytes, ADR claimed, while a comparable version of CRJE requires 80K bytes.

Direct Access storage is more flexible under Roscoe, ADR said, since active files can reside on disk, drum or data cell versus CRJE's disk only.

A Roscoe system will use only half of a 214 disk pack to store 400,000 active statements, whereas CRJE takes a pack and a half, by ADR's calculations.

ADR claims that IBM has stated that CRJE will degrade batch processing operations by 20%, but estimated that Roscoe degrades the same operations by only 10%. Conversely both systems will themselves be degraded by heavy background batch processing.

Partly because CRJE operates as a system task while Roscoe runs as a conventional job, Roscoe will tend to degrade more than CRJE.

Another factor causing greater degradation of Roscoe lies in the fact that CRJE's AFIO access method generates channel programs composed of chained I/O commands.

ADR said that actual costs of operating the two systems eight hours a day at a medium-sized installation were in the range of \$3,300/mo for Roscoe and \$6,500/mo for CRJE. These figures took into account the differences in core and disk utilization in the Roscoe figure as a proportional share of the initial cost of the package.

Johnson Gives DOS/360 Users System Utilization Package

McLEAN, Va. — DOS/360 users have another reporting package for studying system utilization statistics developed by DOS Version 25. The DOS Job Accounting Report System is available from Johnson Systems.

Data analysis of DOS figures enables users to monitor computer environment, measure productivity, study program performance and distribute costs accurately, a Johnson spokesman said.

The Johnson Report System can display all DOS-provided data elements, plus more than 25 computed elements at the job and job-step levels.

The user selects the elements he wants to display, and formats the data as he wishes. He may sort the data, using three control fields, in either ascending or descending sequence. Totals and subtotals of the DOS statistics can be identified with user specified labels.

The report system is designed around a series of control cards which are described as simple enough to allow even non-programmers to generate reports by

following the user manual.

The Johnson program is written in BAL and Cobol, and operates on Model 25 or larger CPUs using either 2311 or 2314 disk units. The package sells for \$950 from Westgate Research Park, 22101.

PDP-15 Given Business Routines

MAYNARD, Mass. — Users of the medium scale PDP-15 can program business applications in Fortran, through a package of subroutines available without cost from DEC.

The subroutines are CALLED from the user's Fortran program to provide formatting, editing and manipulation of strings of data, capabilities that are awkward to handle in normal Fortran coding.

An editing routine, for example, lets the user insert commas, dollar signs and blanks, which are not recognized by Fortran's 64-character code but which are needed to prepare documents such as

checks and invoices.

The editing mask to be used is entered as one of the parameters in the subroutines CALL, a DEC spokesman said.

A series of code conversion routines let the user manipulate and pack data more efficiently than he could with standard Fortran statements. Another series lets the user do all his arithmetic with integer or decimal numbers, in field lengths that he chooses.

The subroutine package is designed to be used with DEC's Batch-15 systems which are structured around the PDP-15 CPU, DEC said.

DOS-to-OS Conversion Facilitated By Remote Batch 360/85 Access

WHITE PLAINS, N.Y. — Users planning to convert from DOS to OS operations can avoid recompilation delays by using the remote batch services of EDP Resources Inc.

Accessing a 360/85 through a local phone call to branch offices, users can run DOS programs under OS with no program conversion. Full OS file management features are available to users.

With the EDP Resources service OS and DOS can be intermixed in the same job stream. DOS compilers supported include Cobol, Asit Cobol, PL/I, Fortran, and RPG. DOS Sort and utility programs can also be run. Charges for the service depend on usage and storage requirements. The firm is at 1 North Broadway, 10601.

'Shampugh' Reads Bad Tapes

BURNABY, British Columbia — Faced with bad data records generated on Hewlett-Packard magnetic tapes, programmers at Simon Fraser University computing center "shampugh" the tapes.

The Slightly Heterical Access Method Processes Unreadable Tapes into Holierith (Shampugh) program is described by the center as a relatively simple IBM 360 utility that reads bad tape and produces a clean copy. Garbage records are not carried over to the output tape.

Shampugh is available without cost to other educational institutions. "Some sort of minimal charge," to cover reproduction costs will be charged to other users.

FOR S/360 AND S/370
OPERATING SYSTEM

TAPE
LIBRARIAN

COMPLETELY AUTOMATIC
AND REASONABLY PRICED

Contact Larry Melton



Horace Mann Educators
Financial Security

216 East Monroe Street
Springfield, Illinois 62701
(317) 544-3801



Since the NOVAR 5-50 can be polled and addressed, many terminals can share a single voice-grade phone line, and can be individually called by the computer using a unique code for each. Will detect transmission errors too, and retransmit until correct.

novar

Novar Corporation • 2370 Charleston Road
Mountain View, Calif. 94040 • (415) 964-3900
Offices in Principal Cities

GTE INFORMATION SYSTEMS

May Set Precedent Users Challenge Metered Rates

By Ronald A. Frank
CW Technical News Editor

SAN FRANCISCO — Data users are gearing up to challenge a proposal here that would put a tax meter on all intrastate phone calls used for data.

The California Public Utilities Commission (PUC) has scheduled a conference for August 4 to set hearings on the "Data Exchange Service" proposal and determine the scope of testimony that will be accepted from users. Hearings could begin in September.

At issue is a PUC staff report which recommends all non-voice calls be charged on a measured rate basis. Such calls are presently charged at normal business line phone rates in most areas.

The report originally was issued earlier this year in answer to a rate increase request from Pacific Telephone and Telegraph Co.

During hearings then, the controversial report was set aside for separate consideration because of the concern shown by data users.

The basis for the PUC staff recommendation apparently is a study conducted by Pacific Tele-

phone in 1970. The study of the Palo Alto telephone central office found that local Bell facilities were "seriously overloaded due to computer access lines," according to the PUC staff report.

Data users are concerned that

state phone service within California, a PUC decision could set a precedent for other areas.

All data users who would be affected by the measured rate proposal should notify the commission that they plan to attend the prehearing conference by July 23, according to a PUC spokesman.

More than 20 complaints were received when the report was first issued.

Among the users expected to appear are General Electric, Comshare, Adapco and possibly the California Retailers Association.

Communications

if the measured rate proposal wins approval it would single out data users for higher phone rates. Although the upcoming hearings will apply only to intra-

State Rulings Predicted For Specialized Carriers

TOPEKA, Kan. — The recent Federal Communications Commission decision allowing competition between the existing and new specialized carriers did little to settle related intrastate issues, according to F. Mark Garlinghouse AT&T vice-president.

Speaking at a meeting of regulatory commissioners here, Garlinghouse predicted that the various state regulatory agencies will have to decide what intrastate services are to be provided by the specialized carriers and on what terms. The state regulators will also have to determine what prices the Bell System will charge in order to compete, he said.

Garlinghouse said that in order for Bell to compete with the new carriers, it will have to abandon its policy of national average pricing and charge ac-

cording to the costs for each route. "That would mean lower prices between large cities and higher prices between small cities," he said.

If the state regulatory agencies require Bell to maintain its average pricing then the potential loss of profits on the competitive routes will have to be made up by higher rates for all users, he said.

True competition will occur only if Bell is allowed to drop its prices, he said. "We are going to have to set our prices more closely to costs [but not below] because that would be unfair to our competitors," he said.

AT&T is currently considering, according to Garlinghouse, increased charges to users who make heavy use of telephone equipment.

edutronics
systems international, inc.

OFFERS A SPECIAL

**AUDIO-CASSETTE
JOURNAL OF
BUSINESS INSURANCE
AND COMPUTERWORLD'S
COMPUTER PROTECTION/
INSURANCE
WORKSHOP \$50**

four audiotape cassettes

Benefit from the counsel of leading experts in

- COMPUTER FACILITY SECURITY • FIRE DISASTER PREVENTION
- INVASIONS OF DATA PRIVACY • COMPUTER MORALITY
- INSURANCE GUIDELINES • PHYSICAL PROTECTION • RISK MANAGEMENT

Mail to: Edutronics Systems International, Inc., 3345 Wilshire Blvd.,
Los Angeles, California 90010

Condition: Please send me _____ set(s) of four audiotape cassettes of the Computer Protection/Insurance Workshop by \$50 per set.

Please bill: ☐ me ☐ company ☐ check enclosed

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Edutronics Systems International, Inc. produces multimedia instructional systems in computer sciences, information systems, reading skills, data processing, management and business skills. Offices in major cities in the U.S. and Europe.

Data Briefs

Multiplexer Handles 18 Channels

SAN CARLOS, Calif. — GTE Lankurt's 25C multiplexer is designed for voice-grade data communications involving remote terminals, batch processors, teletypes, and time-sharing devices.

The 25C provides interchangeable data rates from 100 to 600 bits/sec. and up to 18 data channels can be multiplexed over a single voice circuit.

A single-channel unit costs \$450, and a terminal shell that accommodates up to eight channels costs \$223 per channel. The 25C will operate over all types of transmission facilities including unconditioned voice lines, cable, and microwave systems. It can be arranged for simplex, half-duplex, or full-duplex transmission and either two-wire or four-wire operation. The multiplexer is available for immediate delivery from 1105 County Rd., #4070.

Detrol Adds Data Interface for PDP-8

HUDSON, Mass. — Detrol's CI-16 communications interface connects a DEC PDP-8 to the telephone system over a Bell 103 or 202 dataset and provides a communications link over the dial-up phone network between the mini and a remote computer or magnetic tape terminal.

Features include: automatic answer, full duplex, half duplex or reverse channel modes, and data rates from 100 to 4,800 bit/sec. The CI-16 is priced at \$3600. Delivery is 30 days from Detrol, Kane Industrial Dr., 01749.

Wats Rate Calculator is Free to Users

CLEARWATER, Fla. — Users are able to look up monthly rates for full-time Wats telephone service between any two points in the continental United States, with a pocket-sized calculator available free from Paradyne Corp.

Requests for the Wats rate chart can be made on company letter to Paradyne, 2040 Calumet St., 33515.

PRIVATE LINE DATA MULTIPLEX

What do you get for the money you spend?



TAKE A LOOK AT DIGINET-160 PRIVATE LINE MULTIPLEX--- THE ONE WITH THE BIG PLUS!

In terms of design, features and performance, DigiNet-160 Private Line Data Multiplex is second to none—and it's priced right too! Up to 17 terminals can have their own "private line" to the computer—even though they share a single telephone line * speeds to 600 bps * complete channel speed intermix capability * no data set required (interfaces directly with your telephone line) * channels are fully speed and code transparent * fully automatic * flexibility in mounting (rack mounted shelf, multi-channel cabinet, single channel cabinet)—just some of the features you get with a DigiNet-160 system.

THE BIG PLUS

It's called "GEBITS" (General Electric Built-In Testing System) and it represents the end to "Service-man Roulette" when a computer port goes bad, a telephone circuit goes out, or a terminal acts up! The built-in GEBITS circuitry (patent pending) of the DigiNet-160 lets you pin-point the problem area in short



order and call the right serviceman every time—and it doesn't require a technically trained person to use. GEBITS test procedures are as simple as pushing a button or throwing a switch—and will help you get back on-line in minimum time—and without running up charges for "false alarm" service calls.

Get the complete DigiNet-160 Private Line Data Multiplex story from any of the following:

R. G. E. Hoffman
625 Delaware Avenue
Buffalo, N. Y. 14240
(716) 883-9210

M. E. Donlon
177 Columbia Turnpike
Florham Park, N. J. 07932
(201) 377-0720

D. A. Miles
Suite 821, Wyatt Bldg.
777 14th St., N.W.
Washington, D. C. 20005
(202) 393-3600

F. A. Duran
999 Elmhurst Road
Mount Prospect, Ill. 60056
(312) 255-3200

R. W. Dunn
6300 Hillcroft-Suite 617
Houston, Texas 77036
(713) 771-5334

G. W. Brennan
2154 N. E. Broadway
Suite 110
Portland, Ore. 97232
(503) 228-0281, Ext. 237

J. M. Burt
P. O. Box 4778
Sacramento, Calif. 95825
(916) 927-0163

R. J. Chapple
3636 - 5th Avenue
P. O. Box 3337
San Diego, Calif. 92103
(714) 297-2911

Mountain View Road
Lynchburg, Va. 24502
(703) 845-7311, Ext. 429

W. G. Packham
125 Tycos Drive
Toronto 395, Ontario, Canada
(416) 789-3281


DATA COMMUNICATION PRODUCTS DEPARTMENT
GENERAL ELECTRIC COMPANY, LYNCHBURG, VIRGINIA 24502

GENERAL  ELECTRIC



**INFOREX shared processor system
gives you 8 Keystations
for \$120 a month per Keystation**





**SEARCH, MODIFY, TRANSFER, VERIFY
TAPED DATA . . . \$80 a month / System**
Tape Search lets you retrieve any file or record, from any Keystation, and display it at the Keystation.

COMMUNICATE BETWEEN SYSTEMS. . .
\$80 a month/System Transfer data over a switched network, using standard 201A-rated modems in a "dial-up" environment, or via leased lines, with

**PLAN FOR FUTURE GROWTH WITH
1600 BPI TAPE . . . \$100 a month/System**
Model 1301 Control Unit is available with a 1600 BPI Phase Encoded Tape Drive (556 and 800 BPI densities

...and you can add any of these extra capabilities as you need them

Tape Update In Place lets you change, add to or delete records on tape without transferring them to System's disc.

Tape-to-Disc Transfer allows file division, logical record batching, adding and modifying records—from any Keystation—concurrent with normal operation.

Blocking and Unblocking gives faster, lower-cost data transfer, better utilization of your computer, with full flexibility at time of data transfer.

Program Control Transfer permits taping sets of program control formats at convenient times, then quickly reading them into the System when needed without re-keying.

Tape Proofing affords high-speed verification of the completeness and computer-acceptability of taped data, plus a display of completed record count.

both sending and receiving Systems fully operational or the sending System unattended.

PRINT HARD COPY OF SELECTED FILES . . . \$373 a month Impact Printer has 132 print positions, 200 line/min. speed, can be shared by as many as four Systems. Capabilities include line advancing, page skipping, stored page headings, data reformatting, edit word insertion, selected field printing, multiple line print from one record, printing from computer-generated tape, floating dollar sign, etc.

CONTROL UP TO FOUR SYSTEMS (31 operators) . . . \$120/month for the first two Systems, \$40/month each additional Using any Keystation of connected Systems, a supervisor can monitor operator activity, initiate data transfers, collect files from multiple Systems into a single output tape. Control Units can intermix tape drive densities for maximum tape processing flexibility.

standard for 7-track, 800 BPI on 9-track Drives). Permits faster read-in rates, greater reliability.

EVALUATE THE INTELLIGENT KEY ENTRY SYSTEM for your operation. System leases for \$50 per keystation and \$560 for Control Unit, including maintenance. Full 125-character record display. Key and visual data verification at any station. Disc memory stores 128 program control formats. Functions include automatic pooling on 7- or 9-track computer compatible tape, balance totalling, generating and comparing check digits. Write for full information. We would be pleased to have you check with present users on System performance, supported by our international field engineering staff. INFOREX, Inc., 21 North Avenue, Burlington, Mass. 01803 or Inforex AG, Birsigstrasse 4, 4000 Basel, Switzerland.

Get to know our family.

One member has keystations for under \$100 a month.
Another gives you a complete system for under \$1000 a month.

100/85 With the KEY-EDIT 100/85 your total monthly cost-per-key-station can be under \$100 a month. This is the lowest cost-per-key-station of any key-punch or key-to-tape replacement system available to the high-volume input user today.

100/100 Here's the original member of the KEY-EDIT family. The one that reduces data preparation problems to an absolute minimum. It's completely flexible as to applications and price. And the 100/100 is now available with a variety of newly-designed data stations, optional configurations, model colors, and powerful editing software.

The KEY-EDIT Series 100 Family of data preparation systems gives users a wide range of capabilities to meet the demanding requirements of modern computer operations. Systems features within the family allow the KEY-EDIT user to grow to larger models quickly and easily with no operating changes. But KEY-EDIT users get more than a system.

100/100 This is a high-performance communications oriented data input system, with powerful editing and control processing capability. Even with a wide range of peripheral equipment to choose from, you can have this system for under \$1000 per month!

They get a concept which is working now for government, business, and industry around the world. And KEY-EDIT is backed by reliable service, reliable delivery and reliable people in major cities from coast-to-coast. Contact them. They'll show you how KEY-EDIT can work best for you.

The KEY-EDIT 100/145 for communications and remote editing.



KEY-EDIT

made by **CONSOLIDATED COMPUTER**

World leader in Data Input Equipment

BOSTON, 335 Wynn Street, Waltham, Mass. 02154, 617-891-7100

TORONTO, CANADA, 48 Yonge Street, Toronto, Ontario, 416-366-7843

LONDON, ENGLAND, Northde House, North Circular Road, London N.W. 10, England.

ATLANTA, CHICAGO, CLEVELAND, COLUMBUS, DETROIT, LOS ANGELES, NEW YORK, PHILADELPHIA, SAN FRANCISCO, WASHINGTON, D.C.
MONTREAL, OTTAWA, HALIFAX, WINNIPEG, VANCOUVER, FRANKFURT AND MUNICH, W. GERMANY

July 14, 1971

Page 17

Bits and Pieces

Bucode's 3420 Replacement Uses IBM 2803 Controller

HAUPPAUGE, N.Y. — Bucode's 3424 plug compatible replacements for the IBM 3420 tape drive can now be driven from the IBM 2803 control unit, normally used to run 2401 and 2420 tape drives. IBM's 3420 needs a 3420 controller, which, Bucode said, costs 50% to 200% more than the 2803. Bucode's 3420-S replacement costs \$465/mo. and the 3420-T replacement costs \$550/mo. The IBM units go for \$475 and \$565, respectively, and need the more expensive controller. Bucode is at 175 Engineers Rd., 11787.

Sound Pen for Data Entry

SOUTHPORT, Conn. — Science Accessories Corp.'s System 2041 uses a sound pen and a writing tablet with microphones that sense X and Y coordinates to input inventory data. The system includes a control unit, a visual display for numeric data, and a tape cassette for data recording. Various input forms are available for other applications. The system costs \$6,500 and is available in four to six weeks. The firm is at 65 Station St., 06480.

Package Uses Hazeltine 2000

ENGLEWOOD, Colo. — With Computing Corp. International's "Easyin" system, the user of a Hazeltine 2000 CRT terminal can display an entire form with one keystroke. After the operator enters data to fill out the form, the package edits the data for transmission to a central computer, sending only new data and deleting format data.

Cost is \$3,000 and delivery is in 90 days, from 3375 S. Bannock, 80101.

Shintron Sells Graphic Aid

CAMBRIDGE, Mass. — A bi-dimensional graphic data input transducer for general-purpose computers, the Graphic Data Tablet Ericson series 520 operates on a principle that is said to be a radical departure from conventional techniques.

Manufactured by Shintron Co., the 520 transmits both digital and analog signals of its pen's instantaneous coordinates. Analog bandwidth is 20 Hz and digital outputs are 10 bits parallel for both X and Y. Long term accuracy is better than 2% peak to peak and linearity is less than 0.5% peak to peak. The unit sells for \$2,000 from 144 Rogers St., 02142.

Stand-Alone or Interactive

Small Disk Systems Aimed at Businesses

ANAHEIM, Calif. — Four disk-oriented low cost computers, intended for use by small to medium size businesses, are being offered as the first products of Basic/Four Corp.

The four systems, starting with single-terminal disk configurations and extending to an eight terminal time-sharing setup, range in price from \$23,900 to over \$90,000 for a system with eight accounting machine terminals and extra disk capacity.

The two single-user configurations, the 300 and the 350, have basic prices of \$23,900 and \$28,900 respectively. Both have the same central processor with 8K bytes of memory and a 2.1 Mbyte disk memory.

The 300 system uses an interactive accounting machine terminal, while the 350 has a video display terminal and a medium-speed (60 line/min, 132 char/line) printer.

The time-sharing systems, the 400 and the 500, accommodate up to four or eight terminals, respectively. The terminals can be any combination of accounting machines and video displays.

Basic prices with one terminal are \$29,900 for the 400 and \$30,900 for the 500.

The disk memory can store either 2.1 Mbytes of 4.2 Mbytes on two disks, one fixed and the other in a removable cartridge. There are four reading heads, and average access time is 70 nsec.

A 300 line/min printer is also available, as is a magnetic tape transport. Punched tape and punched card equipment and

communications capability are also being offered.

Forbus, like Basic/Four a subsidiary of Management Assistance, Inc., does the maintenance on the system. Some software is included in the price, but special programming or training is unbundled. The programming language is Basic.

Compared to a disk-oriented System 3/Model 6, the Basic/Four 300, for ex-

ample, is highly competitive. A simple 3/6 with an 8K core memory and 2.4 Mbytes of disk sells for \$63,020 with the 5213 printer and without any program products. The 300 with an 8K memory and a 2.1 Mbyte disk sells for \$23,900, with Basic.

Deliveries of the systems should begin in July, and Basic/Four is quoting delivery times of 60 to 90 days. Basic/Four Corp. is at 1335 S. Claudine St., 92801.

IBM Timings Show 3330 Disks Best Suited for Large Files

By Michael Merritt
CW staff writer

LIDINGO, Sweden — Using an IBM 3330 disk file may enable users to run programs in one-third the time now required with 2314s, or it may save them practically no time at all, depending on the size of the data set being processed.

For large amounts of data with long individual records, the 3330 is a winner. For small jobs, its extra power is wasted. These conclusions can be made from a manual of program timings calculated by the IBM Nordic Laboratory and confirmed empirically on actual machines in San Jose. The calculations are for the sorting half of a sort/merge program, IBM's 5734-SM-1.

The estimates are for 360/30s, 40s, 50s, 65s, 75s, and for the 370/155, and include figures for different memory sizes for these machines. There are timings for execution using the 2400 and 2420 tape

drives, and the 2311 and 2314 disks. Only the timings for the 155 include figures for the 3330.

One interesting conclusion of the timings is that more equipment does not mean faster execution at all. The more memory devices that have to be used as work areas, the longer it takes to do the sort. In one case, for example, using four 3330s means an execution time of 6.2 minutes; if you have to use eight, the time goes up to 7.6 minutes.

Because of this, one 2311 can often give users execution times equal to those achieved by using four 3330s, and in one case, at least, faster than those gained by using four 2314s. This condition applies only to small data sets of short records — in this case a total of 2,000 records 20 characters long.

When it comes to large amounts of data, though, the 3330 is clearly superior. With a record size of 500 characters, and a data set of 25,000 records, four 2311s take 24 minutes to do the sort, four 2314s take 17 minutes, and four 3330s do it in 10 minutes, on a 155 with 64K.

On a 155 with 200K, the same sort takes four 2311s 11 minutes, four 2314s 6.5 minutes, and four 3330s 3.6 minutes. The largest amount of data four 2311s can handle on this computer is 42,000 500-character sets, while four 2314s can handle up to 168,000 of them, and four 3330s almost 600,000.

In the largest sort in the tables, again on a 155 with 200K, six 3330s sort 300,000, 500 character fields in 49 minutes; six 2314s took 156 minutes (over three times as long) to do the same job.

The 103 pages of timings cover a number of different equipment combinations, and include calculated maximum data set size. The calculations are based on the assumption that records in the input data set are in random order. The manual is available from IBM branch offices.

Terminals Undersell IBM by 10%

HAWTHORNE, Calif. — The ADI 760 line of CRT communications terminals from Acme-Divac Industries can operate in a stand-alone mode, relying on their internal memory, or in a cluster mode replacing IBM's 2260/2848 system at a price about 10% lower than IBM's, depending on configuration.

The displays are available with 32- to 80-char/line and from 4- to 30 line/display. They communicate in half or full duplex from 75 bit/sec to 9,600 bit/sec in synchronous or asynchronous serial, or up to 15,000 char/sec in parallel.

Standard character generation is 64 character ASCII. A 9 by 14 filled stroke matrix provides perfectly formed characters, the company said.

Options include format and editing capability, spill screen, remote displays,

lower case, blink, magnetic tape and hard copy output, and a polling interface for remote 360 compatibility.

The 740 requires no changes in standard or Qam software, according to the firm.

There are 27 varieties of terminals, depending on display configuration. Purchase prices for non-volume orders range from \$1,900 for a 4 by 32 display, to \$3,900 for a 30 by 80 display. The 730 pricing controller price ranges from \$3,000 for a four terminal unit to \$4,200 for 16 terminals.

A four terminal, 12 by 80 system from Acme costs \$17,800, while the equivalent 2260/2848 system costs \$20,720.

Acme Divac Industries, Inc., Data Systems Division is at 13025 Cerris Ave., 90250.

Mixed Marriage Works!

The Data Products LARGE CORE STORE and the IBM 360 Computer have been wed. The 360, formerly exclusively engaged to the IBM 2361, couldn't resist the beauty of Large Core Store with four times faster operation at lower cost.

Another of our dollar liberating ideas.



DATA PRODUCTS, Inc.

Systems Marketing
6219 De Soto Avenue, Woodland Hills, California 91364, 213/887-8000

Boston	617/237-1950
Chicago	312/325-6630
Cleveland	216/444-1848
Dallas	214/231-8265
Los Angeles	213/984-9600
New York	212/533-9904
Philadelphia	215/261-8885
San Francisco	415/421-1075
Washington	301/652-8120

POSSIBLE ONLY AT EPG

NEW YORK'S LARGEST.
FASTEST GROWING
COMPUTER UTILITY

RJE or Remote Batch

IBM 360/65
\$125 per hour

SMF Price Schedule Also Available
ANYTIME day or night, 7 days a week.
Per 100K region.

CONFIGURATION IBM 360/65 1024K

4 2314 Direct Access Storage Devices
8 2401MS 8 Track Tape Drives, Dual Density
8 2402 9 Track Tape Drives
3 2401MS 7 Track Tape Drives
3 2311 Disk Drives
3 1402MS High Speed Printers
2 2540 Card/Read/Punches
1 2703 Communications Controller
OS MVT - HASP - RJE

- Convenient Location
- Free Systems Programming Support
- Excellent Turnaround Time
- Free Operators

- Remote Job Entry
- Free Work Space
- 24 Hour Delivery Service

CONTACT: Ted Sabersky, Vice President

E.P.G. Computer Services, Inc. (212) 486-9000 / Night: (212) 486-9576

345 Park Avenue (at 51st Street) New York, N.Y. 10022
Convenient to all NYC transportation / Parking facilities within our building

Hospital System Uses Terminals

BURBANK, Calif. - Executive Computer Systems is offering a data-entry and processing system to hospitals based on desk-top intelligent terminals.

The terminals, Computer Terminal Corp.'s Datapoint 2200s, include dual tape cassettes, which store data for automatic polling by a remote 360.

The 360 then produces processed statements, insurance forms, management reports, and bills on a weekly or monthly basis.

The Mini/Medi/Comp system aids data-entry by performing editing functions and providing complete batch control totals. A line printer is also available for creation of reports on-site.

When the terminals are not being used for data-entry, they can be utilized as small minicomputers with core memory sizes from 2K to 4K. Executive provides most software for the system as well as training.

Each terminal rents for \$225 a month

Printer Costs \$18,000

STAMFORD, Conn. - The Path 1200 computer printer, using xerography, prints the full 96 Ascii characters at 1,200 line/min. The printer uses ordinary paper.

The printing technique eliminates ion guns, ink defectors, character generators, and coated paper which have characterized previous non-impact printers.

Delivery of 80 printers is scheduled for November, and a 132 column version for March, 1972.

The 80 column version sells for \$18,000 and the 132 column model for \$22,000. Interfaces to computers cost about \$4,000. The Path 1200 is made by Uppeter Corp., 73 Southfield Ave., 06902.

on a one-year lease. Reports cost 30 cents per statement and 25 cents for each insurance form.

Computer Terminal Corp. rents a 2K Datapoint 2200 for \$148/mo.

Installations of the system have already begun. Executive is at 805 S. San Fernando Rd., 91505.

Wabash Disk Control Designed for PDP-8e

PHOENIX, Ariz. - A disk memory controller from Wabash Computer Corp. is designed specifically for the DEC PDP-8e.

The Model DMC-600/8e handles up to four disk memories and offers plug-to-plug compatible interfacing. The interface board requires one slot in the Omnibus and provides a one-cycle data break and bus signal buffering for signals to the controller.

The controller is designed to facilitate modular expansion of on-line memory using the firm's Disc Memo series. It operates at a bit rate from 1.9 to 2.34 Mbits. Control is provided for up to 40 Mbits of on-line storage.

The unit costs \$2,700 and is available in 60 days from Wabash Computer Corp., 10202 N. 19th Ave., 85021.

DP Rooms Guarded

WALTHAM, Mass. - An active scanning device, Identicon, originally for railroad identification systems can also be used to monitor access to a data center, and to control tapes or other items being transported into or out of the room.

Identicon was originated by Identicon Corp., and is available within 60 days from 300 Second Ave.



COMMUNICATIONS CAN BE CONFUSING . . .

BUT . . .

Computerworld's editors will clear away that confusion in their Communications Supplement coming in the July 28 issue.

EQUIPMENT TARIFFS
NON-CARRIER VOICE
MULTI-PLEXERS RESPONSE
CRT's TARIFFS
MODEMS EQUIPMENT
INTERCONNECTION TELETYPEWRITERS
CRT's

This Supplement will examine in depth:

- The Advantages
- The Problem Areas
- Tariff Regulations
- Cost Saving Equipment and Services
- Future Growth Trends

of this explosive submarket.

If your product or service works on a phone line, you should be there with your ad.

The environment is right. It's total communications.

The readers are interested. Over 70% indicated high interest in the subject of communications in a recent study.

And Computerworld can deliver that sales contract for an average of 36 cents.

You can communicate in Computerworld's Communications Supplement by calling Dorothy Travis at (617) 332-5606

or contacting the nearest Computerworld Advertising Sales Office to reserve your space.

Advertising Deadline: 5 p.m. EST, Wednesday, July 14.

HELP CLEAR AWAY COMMUNICATIONS CONFUSION

Position Announcements

EDP INSURANCE ANALYSTS

SAN FRANCISCO OPT'YS FOR LIFE SYSTEMS SPECIALISTS

CFO & ALIS PREFERRED

SALARY TO \$20,000

SEND RESUME TODAY! EMPLOYER ASSUMES FEE

R. H. WAYNE AGENCY LTD.

206 Sanome

San Francisco, Ca. 94104

(415) 421-2010

SALES REPS WANTED

TOTALTRAN

...the most successful translation service in the country is looking for EDP salesmen who want an additional line. Be our representative in your area. Over 50 AAA1 clients to date.

- * LARGE DOLLAR CONTRACTS
- * LEADS SUPPLIED
- * LIBERAL COMMISSIONS

Call or Write
Walter Small, Pres.
CPU MANAGEMENT
ADVISORY CORP.
853 Broadway, N.Y. 10003
Phone (212) 777-7722

POSITION ANNOUNCEMENTS

MANAGEMENT/SALES

I am now seeking the following:
REGIONAL MANAGER — Data communications systems, Chicago, N.Y., Dallas, Philadelphia.

OPERATIONS MANAGER — \$27,000
MICR/OCR manufacturing experience.

DISTRICT MANAGER — Private PBX Systems, voice/data, Dallas, Chicago.

SALES REPRESENTATIVE — Data Communications, N.Y., C.R.T.s, Dallas, N.Y., Cleveland, Chicago.

SALES REPRESENTATIVE — Data entry systems, Denver, Philadelphia, Dallas, Detroit, L.A., Boston, other cities. \$20,000.

SALES REPRESENTATIVE — Time shared Numerical Control, Chicago, Philadelphia, other cities. \$16,000.

SALES SUPPORT/APPLICATIONS — Computer Systems \$16,000
Data Entry Systems \$14,000
Stock Brokerage System \$18,000

C.V.'s or write now to:
Mike Brum, Pres., B.A.I.
508 Northern Boulevard
Great Neck, N.Y. 11021
151-1446-3240

DATA PROCESSING OPENINGS
(Large Midwest University)

Need Project Managers and Data Management Specialists. Degree plus experience required.

COMPETITIVE SALARIES AND BENEFITS

Send Resume to:
Box 3417
Austin St.
Newton, Mass. 02160

DATA PROCESSING OPENINGS
(Large Midwest University)

Need Project Managers and Data Management Specialists. Degree plus experience required.

COMPETITIVE SALARIES AND BENEFITS

Send Resume to:
Box 3417
Austin St.
Newton, Mass. 02160

CONFIDENTIAL BOX SERVICE

FOR ADVERTISERS who do not wish their names or addresses to appear in their ads, Computerworld offers a confidential box service. To take advantage of this service, simply state in your initial order that you would like a "blind" ad. Computerworld will then assign you an ad box number and forward all replies. The cost for this extra service is only \$1 per ad per insertion, no matter how many replies are received.

FOR RESPONDERS who hesitate to reply to a "blind" ad because there are certain individuals or firms to whom you do not want to reply, Computerworld offers a screening service at no cost. To take advantage of this screening service, simply address your reply to the box number specified in the ad, attach a separate list of such names, and put both in another envelope addressed to: Confidential Box Service, Computerworld Advertising Department, 797 Washington Street, Newton, Mass. 02160.

Buy Sell Swap

WANTED BY USER

8K 1401 E04 Disk System with 1402, 1403, 1406 and devices.

FROM

USER OR BROKER

CALL 901 332-7820
Computer — Suite 213
3385 Airways Blvd.
Memphis, Tennessee 38116

I.O.A.

Immediate Availability

FULLY RECONDITIONED IN OUR PLANT

INSPECTED & APPROVED FOR IBM M/A

024, 026, 029, 056, 069, 082, 083, 084, 085, 087, 088, 402, 403, 407, 514, 519, 548, 567, 572, 802, 803

ALSO DISC DRIVES, TAPE DRIVES AND PERIPHERALS

I.O.A.

DATA CORP.
INCORPORATED, NEW YORK
212-671-9100 Ext. 101

POSITION ANNOUNCEMENTS

BUY SELL SWAP

IBM

FOR SALE OR LEASE

All Punch Card Equipment
All 360 Models for Short Term Leasing or Purchase
Immediate Delivery on
029's
029's

Data Processing Supply Corp.
9 West 61st Street
New York, New York
(212) 765-5400

FOR SALE

360/30
16K 2.0 Mic. Memory
1051 — 1052
Compatibility
Ideal as Front End Processor

Best Offer
Principals Preferred

Reply to:
CW Box 3414
80 Austin Street
Newtonville, Mass. 02160

SOFTWARE WANTED

FOR NAME AND ADDRESS FILE

to provide selective output from the file of about 50,000 addresses on the basis of a number of characteristics, e.g. ZIP code, state, country, profession, society membership, etc.

The system is to run batch and on-line on a CDC-PDP-10 (48K, 1 BPO-2 disk, 1 1100 tape and inperipherals).

ONLY WRITTEN REPLIES with details and prices are requested to be sent to:

ACTA CYTOLOGICA

The Journal of Clinical Cytology

2841 Maryland Avenue
Chicago, Illinois 60637

MAI

Goes for brokers

Call us for

2311
729
2400

Bob MacNeel

(215) 527-3051

Mike Brody

(212) 557-3742

Burroughs E4000

For Sale

- IBM Key punch
- IBM Sorter
- Card Reader
- Magnetic Ledger Reader

Under Continuous Burroughs Maintenance Agreement

For More Information

Contact Bob Hendrickson

270 Bowling Green
Costa Mesa, Calif. 92626
(714) 549-3775

BUY SELL SWAP

FOR SALE

FROM INVENTORY

2402-1 2402-1 2401-1

2621-5 2540-1 1403-1

65% AVAILABLE IMMEDIATELY

WANTED

360-30-40 Core Modules

3311's & 2941's

2500's

PROFESSIONALS IN PLACEMENT

WE BUY SELL LEASE SUB-LEASE

Glynn M. Waldron, V.P.
Computer Wholesale Corp.
441-447 North Bank of Commerce
New Orleans, Louisiana 70112
(504) 581-7741

WANTED

IBM 360's

ALL MODELS AND COMPONENTS

Prompt replies to your offerings. Call collect or write:

gsm

SMI

Wanted to Buy

IBM 2311's

IBM 360/30F

Available for Lease

360/30 G (2 yr 75%)

360/30 F (1 yr 68%)

FOR SALE

3) 2401 — 2's at \$12,000 ea.

1) 2030 D2 at \$10,000 ea.

Robert R. Russell

(602) 263-0929

Systems Marketing Inc.

3003 North Central Avenue

Phoenix, Arizona 85012

FOR SALE

IBM ELECTRONIC CAM

FOR 402/403

EC 126492

Dated June 16, 1966

CALL: John Norman

616/245-1140

WANTED

More Customers

Like The 300

We've Had &

Wish To Thank

summit

Software Systems Development

DATA MANAGEMENT

Boston area commercial computer manufacturer has launched major new projects and is seeking a number of highly creative software specialists to assume key positions requiring analysis, design and implementation of generalized facilities for one or more of the following:

Data Base Management

(e.g., IDS, IMS, FORTE and similar systems)

Sequential/Indexed Sequential Files

Integrated Data Bases

Shared Access

Recovery/Restart

Privacy

Catalog Management

General Storage & Retrieval Facilities

(e.g., MARK-IV, TDMS, GIS, and similar systems)

Inquiry, Update, Report Generation

Data Base Utilities

Sorts

Design Aids

File Creation/Alteration Services

Prevalence in building of general systems, such as IDS, IMS, and FORTE, is highly desirable.

All inquiries will be held in strictest confidence.

Please forward your resume to:

Computerworld, Inc.

Box No. 2410, 80 Austin Street

Newtonville, Mass. 02160

Only resumes sent directly by candidate can be considered.

An Equal Opportunity Employer

An Introductory Offer to Computerworld's New Information Service (Digesting Over 150 Publications)

☐ There are over 150 trade publications which report on the computer industry. Most people involved in the industry find it a struggle to review more than six.

☐ Computerworld's new information service, "Computa-Data", provides you with the most modern method of reviewing all 150 publications, in less time than you spend on six.

☐ By subscribing to CW's Computa-Data (Monthly Profile Update), you will receive a computerized report every month containing detailed digests of each article of specific interest to you that has been published in the 150 leading trade publications during the past 30 days.

☐ How do we know what's of interest to you? You tell us, by either checking one or more of the Profile subjects described below, or by writing to us and outlining your special interest. The CW computer system does the rest, by reviewing the thousands of articles input each month and selecting for you only those articles you would have selected for yourself to read. Those selected articles are then printed by computer in a convenient 8 1/2 x 11" Report, bound, and mailed to you. Every Profile issue is indexed, cross-referenced and source-documented.

SPECIAL INTRODUCTORY OFFER (Three Issues for \$25)

☐ To help introduce you to this exciting new service, you are invited to accept a three-month trial subscription.

☐ For a total of only \$25 you will get three full issues, packed with data on new products and developments, contracts, new services, competitor's activities, new applications, legislation, trends and forecasts, and a host of other vital data. If you prefer, you may order a one-year subscription—twelve issues—for \$100. Either way, satisfaction is guaranteed or your money will be refunded.



Group I New Products and Applications

The data offered in these Reports and Profiles describe new products being offered to and by the data processing industry. Included are applications for these products as well as new applications for existing products. Reports include names of suppliers; users who have developed new applications for products; new general developments in the field.



(Circle No. on coupon)

- 1 Computers & Minicomputers
- 2 Terminals
- 3 Software
- 4 Components
- 5 Supplies
- 5A Input Devices
- 6 Services
- 6A Peripherals (other than terminals and input devices)

Group II Installation Contracts

This Profile deals with the granting of data-processing contracts. Included are contracts for hardware, software, and peripherals. The information reported includes, whenever available, the names of the companies involved in the contract; a statement of the proposed work; the length of the contract; its proposed start-up date, etc.

(Circle No. on coupon)

7 Installation Contracts



Group III Industry News

(Circle No. on coupon)

- 8 EDP Mergers & Acquisitions
- 9 New Companies & Services
- 10 EDP Activities & Trends
- 10A Foreign Marketing Trends & Forecast
- 10B Corporate Data (financial & marketing activities of EDP companies)

Group IV User-Markets: Developments and Applications

Data-processing developments and applications for specific markets and uses of available products (hardware, software, services, etc.) are highlighted in these Reports and Profiles. Included are data detailing how the product is used for specific jobs; its value to specific user-markets; users of the product; companies offering the product; availability of the product; components of packages for user-markets.

(Circle No. on coupon)

- 11 Accounting
- 12 Banking
- 13 Insurance
- 14 Military
- 15 Communications
- 16 Medical/Hospital
- 17 Data Processing
- 18 Transportation/Reservations
- 19 Financial
- 20 Information Transfer
- 21 Education
- 22 Law Enforcement
- 23 Legal
- 24 Government
- 24A Pollution Control

Group V Reports and Profiles for Specific Job Titles

These Reports and Profiles contain data of interest to people with specific responsibilities in the field of EDP. They deal with developments in data-processing which have a direct bearing on the type of work performed in these positions.

(Circle No. on coupon)

- 25 EDP Managers
- 26 Programmers
- 27 Systems Designers
- 28 Time-Sharing Managers
- 29 Librarians
- 30 Corporate Executives (including MIS data)

Group VI Personalized Reports and Profiles

If you do not see the exact subject you need, please call or write to us and explain your exact needs. There is no extra charge to have a unique Profile made up to your personal specifications.

You may order Profiles on such subjects as company activities, specific products or markets, or almost anything else having to do with the computer industry.

An "ISD System" Information Service

Mail To:

CW-International Systems Design, Inc.
2175 Lemoine Ave., Fort Lee, N.J. 07024
(201) 947-4113

For information or to place an order by telephone, call:
CW Editor
(201) 947-4113

Please send me the Monthly Profiles I have circled below. I understand that any Profiles I am ordering can be returned within 15 days for full money-back refund.

- ☐ 3-Month Trial (up to 3 circled subjects) - \$25. Each additional subject circled - \$5.
- ☐ 1-Year Subscription (up to 3 circled subjects) - \$100. Each additional subject circled - \$20.

- 1 3 5 6 7 9 10A 11 13 15 17 19 21 23 24A 26 28
2 4 5A 6A 8 10 10B 12 14 16 18 20 22 24 25 27 29 30

☐ Payment enclosed ☐ Bill my company ☐ Bill me

Name _____ Title _____

Company _____

Street Address _____

City _____ State _____ Zip Code _____

CI Notes

14-mil Core Unit Planned

MT. VIEW, Calif. — Core Memories Inc., a division of Data Products Corp. is working on a core memory system using 14-mil cores at its plant here.

The Store 50 system, to be announced in January, is designed for main memory applications between the firm's Store 33 unit and large core storage devices. The unit will take advantage of the low power needs of the 14-mil cores to keep prices down. Core Memories is also reported to be working with 12-mil cores for future 2-wire applications.

IBM Motor Earns U.S. Patent

SAN JOSE, Calif. — A moving coil motor used with the IBM 3330 disk drive has earned a patent and a \$6,000 IBM Outstanding Invention Award for two of the company's engineers.

The motor provides positioning and servo control of read/write heads in the unit. Most previous IBM disk products use hydraulic techniques to position heads. U.S. Patent 3,576,454 was assigned to IBM by inventor Robert J. Black and Laurence R. Beach, Jr.

FAA Ups Raytheon Pact

WASHINGTON, D.C. — The Federal Aviation Administration has awarded a contract amendment slightly under \$5 million to Raytheon Co. to expand the information processing and display capacity of air traffic control automation system displays.

The changes will increase the electronic memory of each of the 16 computer display channel systems previously ordered from Raytheon so each system will be able to handle up to 120 controller displays as compared to 60 for the present design.

Supershorts

Digital Computer Controls, Inc., has placed Transworld Data Systems, Ltd., Ruislip, Middlesex, England, to distribute the D-112, D-112H, and D-216 minicomputers throughout the UK.

The number of NCR computers installed or on order in Switzerland now exceeds 450, approximately one-third of the country's total current computer population. The Swiss claim to have more computers per capita than any other country in the world except the U.S.

Peripherals Corp. has signed an agreement with Digital Equipment Corp. for the field service support of "Voicepac-2000" audio response systems.

UL approval has been received for Peripheral Equipment Corp.'s 6000 and 7000 Series magnetic tape transports.

Sycor, Inc. has agreed to a North American Corp. purchase of a minimum of \$12 million of Sycor's terminals over the next three years subject to Sycor entering into leases of these systems with end-users.

Efficient Leasing Corp. has signed the first operating lease on an IBM 370/145 with "a major national bank in the northeastern U.S."

Mini Boom Seen

Computers to Pace Process Control Rise

NEW YORK — The total process control market should grow at a rate of 7.5% yearly through 1978, but the computer portion should show a 15% increase during the same time span, according to Frost and Sullivan Inc. here.

The total process control market will be valued at a shade over \$2 billion in 1978, the study shows, up from just under \$1 billion in 1968. During the same time the computer portion of process control

systems will rise from \$91 million to \$370 million in value.

Mini Use Up

The use of minicomputers in the systems will grow faster than the total digital process control computer market. Mini systems accounted for 8.8% of the total computer sales in 1968, but this will jump to 18.9% by 1973 and 31.1% for the total computer sales to the process

control market by 1978, the study predicts.

The analytical instrument portion of the total process control system is expected to show the next largest growth rate behind the computer segment, with an average growth rate of 11.3%.

Sales of digital process control computers will be heaviest to the chemical industry in the next 8 years the study shows. The chemical industry purchased 20% of the computers used in 1968 and will account for 31% of the sales by 1978.

Power Use Down

The electrical power industry accounted for the largest portion of the sales in 1968 with 25% but will only account for 15% of the market in 1978, according to the study.

Close competitors in terms of the percent of the market will include the metals industry and the petroleum industry, followed by paper, stone, clay and glass firms; and the oil and gas companies.

Export Controls Seen Barring Any Computers for Red China

By a CW Staff Writer
WASHINGTON, D.C. — Any American computer maker planning on increased

trade with mainland China to take up some of the slack in the domestic market, had better take another look.

Computer Lessors Plan Legal Moves in IBM Struggle

By a CW Staff Writer
WASHINGTON, D.C. — Computer lessors are moving into the legal arena in their battle with IBM, which in the past has featured aggressive advertising, much talk, and studies of how to keep leased 360 equipment in the field in spite of the 370 threat.

The Computer Lessors Association has established a legal action committee "in response to IBM's recent marketing tactics, which appear to raise anti-trust questions," according to James F. Benton, executive director.

The first move of the new committee, headed by John Randolph, Randolph Computer Corp. chairman, was the filing of an amicus curiae brief in the U.S. District Court in Minneapolis in support of the Greyhound Computer Corp. application for an early trial date in its suit against IBM.

Future plans call for the committee to work with the U.S. Justice Department and others who have filed antitrust suits against IBM. In addition, it will consider legal action to protect the interests of its member companies.

While most minicomputers can be offered in configurations under the 2,048 bit maximum memory most usually given as the limiting factor for general trade license for shipments for China, there are several other limitations that come into play.

For example, according to regulation 714.5 of the Export Control Act, American firms could not export — without special license — "digital computers and statistical machines used in conjunction with punched cards or tape operated by one or more common control units, and capable of all of the following:

"A) Accepting, storing, processing, and producing an output in numerical or alphabetical form;

"B) Storing more than 512 numerical or alphabetical characters or having a memory of more than 2,048 bits;

"C) Performing a stored sequence of operations that are modifiable by means other than a physical change in circuitry, and

"D) Selecting a sequence from a plurality of stored operations based on data or internally compiled results."

Even stripped down systems, that could be expanded to larger memory sizes, would be barred from trade.

In addition, the Export Control Office said that memory modules would not be an item that could be traded under the general classification.



145 Delivered

The first delivery of the first IBM computer to use all monolithic memory — the 370/145 — has arrived on the Stanford University campus almost 7 weeks ahead of scheduled installation. The system will be used in Project Info, a system designed to streamline university administrative decision making. IBM claims to have run 25,000 hours of systems test on 145s before the delivery.

Western Firms Predicting Better Year

By E. Drake Lundell Jr.
CW Computer Industry Editor

The view from the West Coast is definitely up in sharp contrast to the same period a year ago when "gloom and doom" talk pervaded most discussions in Texas and California industrial centers.

And the view of the OEM houses is especially bullish now that at least a minority appear to be underway in the business.

At Ampex's Computer Products Group — where they have recorded a profit in each of the last 18 quarters even though the overall company has not done so well — the OEM business bottomed out in the second quarter of last year.

At Pertec, which used to be Peripheral Equipment Corp. (PEC) but is now a holding company for PEC and other firms, traditional OEM customers are

On The Road

coming back into the market, according to Stuart P. Mabond, executive vice-president. The firm wasn't hurt by the slump in traditional customers last year because the boom in "cost key" to disk business took up the slack caused by a slowdown of orders in other areas.

The key to disk market was also a significant contributor to Century Data Systems' OEM business in the past year, according to Marketing Manager William Sewalk.

At the same time, Sewalk said that while there has been a pickup in the OEM business, the "overall market is not coming back" and that the number of disk drives sold is not on the increase.

There should not be any significant change in the business before the end of the year or beginning of next year, he said. Sewalk indicated that many of the traditional OEM customers have let their inventories shrink in order to save money during the tight money times, and that it now is a question of "how long people cannot spend before severe limitations set in."

According to Eugene Prince, Ampex Computer Products vice-president and general manager, the main action now in the OEM field is in core stocks, which picked up first, reflecting improvements in the minicomputer area.

Behind the core stock business, at least at Ampex, the major area of the OEM market showing a turnaround is in the low performance tape drive area, especially the cassette tape which Prince estimates was delayed about a year due to the recession.

The third area showing improvement, Prince said, is new core systems products.

IBM Replays Tape Tests

BOULDER, Colo. — IBM engineers are using the latest replay technique developed for television sports coverage to test computer tape units produced

Railroads Add Seven Systems in Six Months

WASHINGTON, D.C. — The number of computers in use by American railroads increased from 243 to 250 in the first six months of 1971, according to the Association of American Railroads here.

IBM led with 94% of the total installations, RCA (6.5%), followed by Univac (3.7%) and GE (3.5%). Other manufacturers with installations in the field included Collins, Honeywell and NCR, in that order.

by the firm's laboratories here. During a test, the tape subsystem is linked to a video disk recorder through a transient events analyzer. If the analyzer detects an error, it interrupts the data flow from the subsystem and stops the video recorder, preserving on disk the signals as they appeared during the error condition.

On command, the captured waveforms are replayed repetitively into a storage oscilloscope. A parallel timing track is used to synchronize the signals during playback and to compensate for variations in disk velocity.

In the system, the revolving video disk utilizes destructive writing to retain several milliseconds of signal patterns on as many as 32 channels, the engineers said.

Expansions

A \$1.5-million data processing center serving financial institutions in the northern New Jersey, New York and Philadelphia areas has begun operations in Princeton, N.J.

Called the NCR Metropolitan Data Center, the new facility is NCR's 11th data center in the U.S. and Canada.

The newest center is located in a recently completed 20,000-sq-ft building on a 5-acre site on the Old Trenton Road.

Surety Life Insurance Co., Salt Lake City, Utah, formed a separate computer division — Surety Computer Services — for systems consulting, contract programming and machine time services.

Extrex, Inc. has moved to new headquarters at 168 Middlesex Turnpike, Burlington, Mass. The 30,000-sq-ft facility will house

administrative, corporate and manufacturing operations.

Control Data Corp. has opened a new DP center at 700 Penn Center Blvd., in the Monroeville area of Pittsburgh.

Oronix Memories, Inc. has moved to its new 25,000-sq-ft facility adjacent to Los Angeles International Airport.

Cincom Systems, Inc. of Cincinnati, Ohio, has opened sales service offices in Palo Alto, Calif. and Toronto, Canada.

General Electric Co. expanded its international time-sharing services network to Puerto Rico.

A new data center has been established in Mount Laurel industrial Park near Philadelphia by the Data Services Division of GTE Information Systems Inc.

Buy Sell Swap

FOR SALE BY USER

360/40 128K CPU
65% IBM Price
Principles Only
Reply:
CW Box 3415
80 Austin Street
Newtownville, Mass. 02160

FOR SALE SYSTEMS

Paper Tape
Code-to-Code Converter
Can also serve as a
paper tape pooler.
Excellent Condition
Cost \$5000
Bargain at \$1250
DATACRAFT BUSINESS
SERVICE

577 Haddon Ave.
Collingswood NJ 08108
(609) 858-4580

FOR SALE

IBM 360-30, 308, 309, 446S,
1950, 3237, 3456, 4468,
8960, 4427, 7915
1061-N Control Unit
With 3130, 4410,
4411, 4469
1052 Keyboard Printer
2311 Control Unit
With 1950, 3010, 5637
1403-1 Printer
With 3640
2403-1 Card Reader Punch
2403-1 Mag Tape
Drive and Controller
(2) 2402-2 Mag
Tape Unit With
3571, 7125
(6) 2311 Comp.
Disk Drives
IBM 1130-28 BK CPU
CDC 1700 CPU
(2) 2402-2 Mag
Tape Drives
1130-1 Mag
Tape Drive and Controller.
Price \$37,950.00
For 5 Drive and
Controller
Calscomp 835
Microfilm Plotter
EVE GREENE DATA SYSTEMS
P.O. Box 20102 1301 W. 22nd St.
Bloomington Okla 74209
Minn. 55420 Ill. 60621
(612) 866-0054 (312) 956-0860
Contact
Floyd Peterson Victor Olson

Computerworld's Advertising Sales Offices

Vice President — Sales
Neal Wilder
Sales Administrator:
Dorothy Travis
COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160
(617) 332-5606

New England Regional Manager
Robert Ziegler
COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160
(617) 332-5606

Mid-Atlantic Regional Manager
Donald E. Fagan
COMPUTERWORLD
228 West 34th Street
Suite 1511
New York, N.Y. 10001
(212) 694-5644

Los Angeles Area:
Bob Byrne
Sherwood/Byrne/Clarkson
& Associates
1541 Westwood Blvd.
Los Angeles, Calif. 90024
(213) 477-4208

San Francisco Area:
Bill Healey
Thompson/Healey Assoc.
1111 Hearst Bldg.
San Francisco, Calif. 94103
(415) 362-8647

To those who signed IBM's Fixed Term Plan for peripherals:

WHY NOT A FIXED TERM PLAN FOR THE 360-30 CPU?

Why not? If leasing peripherals on IBM's Fixed Term Plan is better than their conventional rental plan—and you, IBM and we agree that it is—why not lease the rest of the system the same way?

Computer Leasing Company has added a Fixed Term Plan which allows you to lease the 360-30 Processor under the same fixed term arrangement which IBM offers for some peripherals.

The Computer Leasing Company Plan offers the same two contract periods: (a) 12 to 23 months and (b) 24 months.

The Computer Leasing Company Plan extends the same discounts. For a 12 to 23 month contract the monthly lease charge is 92% of the standard IBM rental charge. For a 24 month contract it is 84% of the IBM charge.

There is no charge for overtime use.

The maintenance arrangements are the same as IBM's.

The Purchase Option is the same.

Early Termination and Contract Extension provisions are the same.

So why not? If you're saving \$140 a month on a printer, why not save another \$750 by leasing the CPU? Or \$2100 a month by leasing the whole 360-30 system?

Why not? It's IBM's equipment. It's IBM's maintenance. It's IBM's plan.

It's your money.

UCC computer leasing company a subsidiary of
UNIVERSITY COMPUTING COMPANY

2001 Jefferson Davis Highway, Arlington, Va. 22202 (703) 521-2900
One Cherry Hill, Cherry Hill, N.J. 08034 (609) 667-8385
9068 Wells Fargo Building, San Francisco, Calif. 94104 (415) 391-2936
299 Park Avenue, New York, N.Y. 10017 (212) 421-8680
500 N. Michigan Avenue, *714, Chicago, Ill. 60611 (312) 323-6953

Litton ABS Serial Printer, Card Reader Designed for OEM Use

CARLSTADT, N.J. — Litton Automated Business Systems has announced its Model 34 serial impact printer and the Model 64 optical card reader.

The Model 34 operates at up to 35 char/sec using an interchangeable 96 character Ascii code moving print wheel.

The printer has up to 192 print positions.

New OEM Products

tions and tabs at 350 char/sec or 35 in./sec in either direction. The printer has half line as well as full line spacing.

Model 34 is available without keyboard for \$2,200; control electronics cost \$995 and the separate numeric keyboard costs \$340.

The optical card reader reads pencil and pen marks, black printed marks, key-stroke edge notching and Hollerith or other punched holes, singly or mixed on one card. Its speed is 2 card/sec with automatic demand feed of variable length documents from 3-1/4 to 8-1/2 in. wide and from 9-1/2 to 10-1/8 in. long.

Model 64 features an internally stored program and has two output stackers. The 64 interfaces to teletypewriters, magnetic tape, communications terminals, printer, Litton ABS/124 computer and 029 keypunch.

Single unit price is \$6,400 from the firm at 600 Washington Ave., 07072.

Mark-Space Shows Punch/Reader

IRVINE, Calif. — Plug-in ASR capability for EIA, RS232C, internal and 103A compatible hard copy and CRT remote data terminals, switch selectable speeds and editing capability are features of the MSD 300 P/R paper tape punch and reader from Mark-Space Devices, Inc.

The 300 has send and receive speeds of 10, 15 and 30 char/sec, switch selectable, with full- and half-duplex operation.

The firm is at 17835 Sky Park Circle, P.O. Box 4260, 92664.

Unisem 1,024 by 1 RAM Out

TREVOSE, Pa. — A new 1,024 by 1 dynamic MOS RAM from Unisem operates over the -55° to 125° C MIL temperature range. The Unisem device is made with a technique that combines low-threshold, 1-0-0 lattice, P-channel enhancement technology with special N+ "channel stoppers" that provide field-inversion protection.

The device is fully decoded and features static-charge protection on all inputs. Access time is 250 nsec.

The firm is at P.O. Box 11569, 19116.

Displaytek Has Thermal Print Head

DALLAS — A thermal print head featuring silent operation has been developed by Displaytek Corp. The DC-1157 also features drive circuitry and printing elements integrated on a single silicon chip and can incorporate decode circuitry in the same package.

The unit has a silicon-integrated circuit with a five by seven matrix of dots formed by semiconductor elements. The dots can be heated in patterns to form any of the 96 standard Ascii code characters. The dots require only 4 to 10 mW to heat, and can achieve a print rate of up to 60 char/sec.

The print head operates from 16 V, and each dot requires an average current of 100 mA.

Prices on the DC-1157 range from \$50 to \$65 apiece for annual quantities of 500 to 1000 units to \$20 to \$30 apiece for annual quantities of 10,000 or more from the company at 4241 Sigma Road.

Multi-Channel Power Supply

SANTA MONICA, Calif. — Pioneer Magnetix' light-weight power supply is de-

signed for small to medium size computer systems and peripherals.

The standard unit operates over an input voltage range of 105-135 Vac, 47 to 2000 Hz, and is available with output voltages from 4- to 50 Vdc and output currents to 60 A. Operation is independent of input power frequency, according to the firm at 1745 Berkeley St., 90404.

MOS Encoded Keyboards Bow

KIMBALL, Neb. — MOS encoded keyboards with standard 47, 56- and 73-key configurations from George Risk Industries, Inc. include Ascii 9 bits plus strobe, odd and even parity, electronic lockout, quad mode of operation and TTL/DTL compatibility. The 47-key unit, Model 647, will sell for about \$88 in quantities from the firm at P.O. Box 1035, 69145.



Litton Model 64 Card Reader



Litton Model 34 Printer



Unisem 1,024 MOS RAM



MSD 300 Tape Punch

ACTION\APL 370 !

ACTION\APL, the only commercially available and user proven APL system now on fourth generation equipment.

ACTION\APL. If you're already an APL user, you'll recognize ACTION\APL's unmatched versatility. New fast formatting. All kinds of plotting. Business packages. Scientific packages. COGO. CPM. COM. LP. CRT. Accounts payable. Circuit analysis. And more! Join the swing to ACTION\APL. Chances are it's locally available in your city. **SYSTEM370.** ACTION\APL's new fourth generation equipment is four times faster than conventional systems! Yet its reliability is greater than ever.

48K VS. The standard APL workspace is 32K. ACTION\APL's 48K workspace gets 50% more work done. 50% more data can be stored. And 50% larger programs can be executed without that tiresome old [SAVE] [LOAD] [COPY] routine.

FILES. If you need more than a 48K workspace, we have files storing 144K each. As many as you want. Sequential, direct and keyed access methods are supported, all through easy to use functions which may be embedded within other functions. You can put the data on the file yourself from your terminal, or send it to us for loading. From disk, tape, cards or whatever. And the files are buffered for super high velocity performances.

RJE. If that 150 wpm printer gets you down, ACTION\APL's exclusive RJE is the answer. Reports and cards can be generated at high speeds. Standard and upper-lower print trains are available. RJE also supports compilation of other languages. . . Assembler, COBOL, FORTRAN, PL/I and RPG.

CHECK THE ADVANTAGES OF ACTION\APL. It's been in use for over two years, and it's getting better all the time. ACTION\APL has the largest commercially available public library system. ACTION\APL offered the first commercially available file system. ACTION\APL offers the only RJE system. ACTION\APL is the only commercially available system on fourth generation equipment. It works with key driven terminals, paper tape terminals, punched card terminals, CRT terminals, COM terminals, graphic plotting terminals. . . in fact, all kinds of terminals. And ACTION\APL software is available for in-house installations.

ACTION\APL is now available in Boston, New York, Trenton, Miami, Richmond, Philadelphia and Washington.

For your user number, call or write:

Joel Lamb, APL Services, Inc.
865 Lower Ferry Rd., Trenton, N.J. 08628
(609) 883-0050. . . or,



THE COMPUTER COMPANY

SEVENTY AND FRANKLIN BOULEVARD, BOSTON, MA 02210, (617) 648-9823

Fastran Proposal Boosts DP-Based Security Clearance

WASHINGTON, D.C. — Computer-based securities clearance received another boost recently when Robert R. Maller proposed a Fast and Safe Security Transaction System (Fastran) in testimony here before the Securities and Exchange Commission Conference on the Future Role of the Stock Certificate.

The system proposed by the senior vice-president of the U.S. Trust Co. would employ a dual network of integrated computers in a three level hierarchy and would be established as a federally incorporated bank financed by capital subscription of all brokers, dealers, banks and other institutions.

"The top of the computer hierarchy serving 12 regions would include a pair of large, or major, computers, operating in parallel

and containing all the informational and historical records that should be kept within the system.

"Purchases and sales would continue to be carried out through normal channels — the exchanges, over the counter, third markets, etc. Each party to a transaction would enter it on the nearest terminal, with proper identification. The trade would

regional basis; trades between two regions would be compared and verified by the primary level computers," Maller said.

"The network would be used to verify the holdings to the on-line records of the transfer agent. In the event of a difference, after the extension of each of the trades and an attempt at

comparison, an exception message would be communicated to both parties.

"The time interval between inputting, verification and comparison, of course, would have to be statistically set, and a specific time interval established for reporting exceptions," he said.

Financial

be communicated to the minimum level possible.

"It both parties to the trade were within a single zone, the zone computers would perform the comparisons; trades within a region would be handled on a

Hospitals, Data Communications Seen Best Investment Opportunities

By a CW Staff Writer

NEW YORK — The two most significant and attractive areas for investment in the 1970s will be the specialized data communications common carriers and the hospital industry, especially data processing for hospital applications, according to A. Bruce Murray, president of Coenen & Co., Inc.

"If you put the hospital market and data communications together, they represent 10% of the GNP — hospital care is 6%.

National CSS Shows Three-Month Profit

STAMFORD, Conn. — National CSS, Inc.'s revenues during the first three months amounted to \$2.5 million, up 74% over \$1.5 million of the same period a year earlier.

Pretax profits reached \$98,026 or 9 cents per share, compared with a loss of \$663,379 in the same period a year earlier.

and data communications is 4% — and there will be some unusual investment opportunities available in this field," he said.

Presently, Murray said, "we are experiencing an important change in these industries, and this change is being brought about by the emergence of the specialized common carriers."

"For example, I suspect the most exciting area of hospital information systems will be the shared systems. These will expand rapidly because of the influence of Medicare."

"Up until now, most of the hospitals in the country have been run on a very antiquated basis by non-professional management which has not properly identified costs," Murray continued.

"But the government will no longer accept just a single bill. It will want to see a breakdown in costs and that is where shared systems will be needed," he said.

FOR SALE

IBM 360/651

IBM 360/651

IBM 360/40H

TREMEUDUS SAVINGS. Call or Write Today
NVC Computer Sales

Suite 406 Benjamin Fox Pavilion, Jenkintown, Pa. 19046
Write or call collect (215) 887-5404

IBM1440
for sale

1441 C.P.U. Model A04 8K
1442 Card Read/Punch Model 2
1443 Printer Model 2
1447 Console Model 1
1311 Disk Model 1
1311 Disk Model 2

Principals only. Call Raymond Kendall
collect (219) 743-0383



PEOPLES TRUST BANK
913 South Calhoun Street
Fort Wayne, Indiana 46802

SEND FOR FREE SAMPLES of these cleaning products for computer reliability

TEKWIPE A detergent 100% cotton-free but developed for critical cleaning where non-contamination is essential

TEKPADS and DISC CLEANING A 51% solution of isopropyl alcohol pre-esterified pad, with special for cleaning magnetic disks without affording information stored

FOAM-SHOTS A totally fast-free wash for non-contaminating cleaning of small, critical areas of data processing equipment

COMPLETE CATALOG This catalog describes the complete line of Tekwipe cleaning products for computer reliability

CHECK BOXES FOR FREE SAMPLES.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

The TEKWIFE Company, Hillsdale, New Jersey 07642

COMPUTERS NEED
U.C.P.*

*UNINTERRUPTIBLE COMPUTER POWER

SYSTEM 700UC PROVIDES

- VOLTAGE CONTROL
- FREQUENCY CONTROL
- TRANSIENT CONTROL
- LINE ISOLATION
- BRIDGES UTILITY POWER INTERRUPTIONS



Get the facts on
UNINTERRUPTIBLE COMPUTER POWER

Call Frank Wood (703) 355-2803

POWER SYSTEMS & CONTROLS, INC.

500 8th Street • Richmond, Virginia 23211



Nickels & Dimes

IBM's done it again — the regular quarterly cash dividend of \$1.30 per share of common stock will be payable Sept. 10 to holders of record Aug. 12.

\$\$\$

Business is good in education — at least for Advanced Systems, Inc. which doubled last year's totals in the fiscal year ended March 31. The totals were income of \$436,577 (71 cents a share) on revenues of \$2.8 million in the latest year. At the end of the year there were more than 800 customers for the firm's video tape training courses in DP.

\$\$\$

Merger announcements in the second quarter reached 1,039, down 21% from the same period in 1970, according to W.T. Grimm & Co. For the first three months the total (2,189) was off 19%. There was a substantial increase in the sales of divisions, however, especially in the computer service area, where 60% of the transactions were spin-offs and divestments.

\$\$\$

Data 100 Corp. has made three moves in the financial arena. First, it has announced an agreement whereby Chandler Leasing Division of Pacific Leasing Corp. will finance \$16.5 million in equipment during 1971 and 1972, with Heizer Corp. guaranteeing the risk of owning the equipment in exchange for a 7-year warrant to purchase 420,214 common shares and other considerations. Secondly, the firm completed a long term debt and equity financing totaling \$4.2 million with a group of institutional investors. And finally, the firm and a group of three banks extended a \$2 million revolving credit agreement by one year to July 31, 1972.

\$\$\$

American Regital Corp. plans a private placement of up to 250,000 shares of common stock at \$6 per share. If all shares are sold there will be 696,105 shares outstanding. The firm had a loss of \$800,000 in the fiscal year ended April 30 on revenues of around \$300,000.

AMERICAN USED COMPUTER CORP. FOR SALE

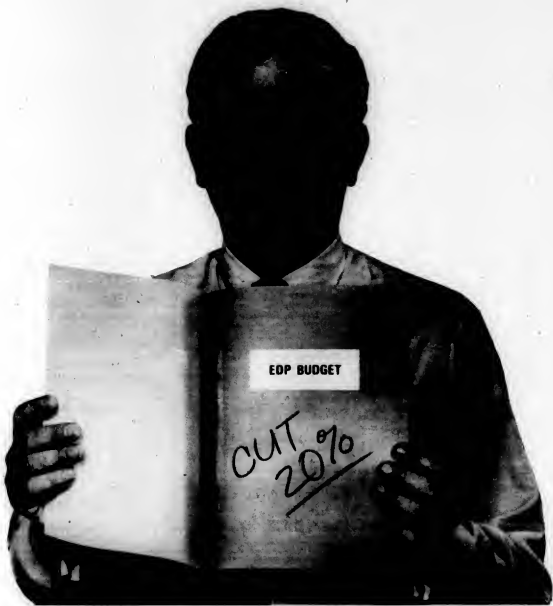
DEC	IBM
TIME	1401
SHARED	1440
BI. SL. 8 C/P's	1620
8 SERIES	RCA
COMPONENTS	70/45
POP 10 UNITS	3301
HON	UNIVAC
DDP 616	418/1004
COMPONENTS	1004
H 200	DATA
GE	GENERAL
436	NOVA
Call 617-227-8634	
15 School St Boston, Mass.	



Computerworld Stock Trading Summary

CLOSING PRICES THURSDAY, JULY 8, 1971

		PRICE							PRICE						
F X C H		1971 RANGE	CLOSE JULY 8	1971 HIGH	1971 LOW	NET CHG	E X C H		1971 RANGE	CLOSE JULY 8	1971 HIGH	1971 LOW	NET CHG	E X C H	
		(1)	1971						(1)	1971					
SOFTWARE & ERP SERVICES															
A	ADVANCED COMP TECH	1-9	1 1/2	1 1/2	1/8	+7.6			N	NASHUA CORP	29-47	45	0	0.0	
A	AMPLIFIER DATA RES	2-3	1 1/2	1 1/2	1/8	+5.3			O	REYNOLDS & REYNOLDS	17-18	16 1/4	1 1/4	+2.2	
O	APPLIED LOGIC	1-1	3/4	3/4	1/8	+0.0			O	STAMPED REGISTER	20-21	21 1/4	1	+1.0	
O	APIES	1-1	1 1/4	1 1/4	1/8	+0.0			O	TAB PRODUCTS CO	8-15	15 1/4	5/8	+1.8	
N	AUTOMATIC DATA PRNC	14-65	64 7/8	64 7/8	1/8	+0.0			N	VARCO	25-33	30 1/4	1 1/4	+0.8	
D	AUTO SCIENCES	4-8	4 3/4	4 3/4	1/2	+11.7			A	VARSHAM MAGNETICS	7-10	7 1/8	1/2	-0.5	
O	ADDITIVE DATA SYS	1-2	1 1/8	0	0.0				N	WALLACE BUS FORMS	18-20	22 1/4	1 1/8	+0.5	
O	BRANTON APPLIED SYS	1-1	3/8	1/4	+0.0				COMPUTER SYSTEMS						
N	COMPUTER FASHION	1-1	3/4	0	0.0				N	BUROVICH CORP	105-138	127 3/4	1 5/8	-2.7	
N	COMPUTER NETWORK	1-1	3/4	0	0.0				N	CONTROL DATA CORP	13-20	22 7/8	1 1/8	+1.1	
N	COMPUTER PROPERTY	6-11	6 1/4	1/4	-3.4	-0.0			O	DATA GENERAL CORP	14-49	58 1/8	1 1/8	+1.1	
N	COMPUTER TASKS	9-17	13 1/4	3/8	-2.7				N	DIGITAL EQUIPMENT	51-85	78 1/8	1 1/8	+1.1	
O	COMPUTER TASK GROUP	1-3	3/4	3/4	+0.6				A	ELECTRONIC ASSOC.	5-8	7 1/8	1 1/8	-1.7	
O	COMPUTER USAGE	5-16	2 1/2	0	0.0				N	FOSSARD	25-45	44 1/4	0	0.0	
O	COMP AUTOMOT REPORTS	6-13	6 1/4	1/4	-5.8	-0.1			O	GENERAL AUTOMATION	11-20	13	1/2	+1.2	
A	COMING INC & SOFTWARE	27-45	36 1/8	1/4	-5.3				O	HEWLETT ELECTRIC	10-12	12 1/2	1 1/8	+0.2	
O	CONRESS	2-4	2 1/2	1/2	-3.0	-0.0			N	HEWLETT-PACKARD CO	10-45	40 1/2	1 1/2	+1.2	
O	CONSUMER	4-8	4 3/4	1/8	-2.7				N	HONEYWELL INC	43-115	99 1/2	1 1/8	-1.7	
O	CORNDL. ANAL. CRT.	1-2	1 1/8	0	0.0				N	IBM	310-364	311 1/4	1 1/2	-2.0	
O	DATA AUTOMATION	1-4	1 1/2	1/4	-14.2				N	INTERDATA INC	5-11	9 1/4	1/2	-1.1	
O	DATA PACKAGING	1-1	3/8	1/4	+0.0				N	MCA	18-49	44 3/8	1 1/8	+0.0	
O	DATATION SERVICE	1-1	3/8	1/4	+0.2				N	RAYTHEON CO	27-46	36 1/8	1 1/8	+0.1	
L	DATAPAT	4-10	7 1/4	1/4	-5.0				O	SCI. CONTROL CORP.	4-7	7 1/8	1 1/2	+0.7	
O	DIAGNOSTICS	1-3	3/4	0	0.0				N	SPIRIT BAND	25-38	33 1/4	1 1/4	+0.1	
O	ERP RESOURCES	7-16	10	1 1/4	-11.1				A	SYSTEMS ENG. LABS	10-18	13 1/4	1 1/4	+0.1	
A	ELECT COMPT PRNG	3-7	3 1/2	0	0.0				N	VARIAN ASSOCIATES	13-17	17 1/2	1 1/4	-3.4	
O	ELECTRONIC DATA SYS.	7-15	17 1/4	3/4	+3.1				N	VICTOR COMPUTERS	15-27	30 1/2	1 1/4	-0.0	
O	INFORMATICS	7-15	17 1/4	3/4	+3.1				N	WARD LABS.	19-20	42 1/2	1 1/4	-3.4	
O	KRANE ASSOCIATES	5-14	6	3/4	+1.2				N	XEROX CORP	85-119	111 1/2	1 1/8	+1.7	
O	KEYDATA CORR	9-14	10 7/8	1/8	-1.1				LEASING COMPANIES						
A	MANAGEMENT DATA	8-11	10	1 1/4	-1.1				A	BROTHER COMPUTER	13-27	10 5/8	1 1/8	+0.6	
O	NATIONAL CSS INC	7-15	10 1/8	0	0.0				O	BRESNAHAN CORP.	2-8	7 1/2	1 1/8	+0.1	
O	NET COM ANALYSTS	1-4	1 3/4	0	0.0				A	COMPUTER EXCHANGE	4-9	4 3/4	1/4	-0.1	
O	NET COMP. SERV.	1-2	1 1/4	0	0.0				A	COMPUTER INVESTS GRP	9-14	11 3/4	1 1/2	+1.6	
N	PLANNING RESEARCH	16-26	21 3/4	5/8	+2.9				N	DATA PROD. F & O	11-19	13 3/8	3/4	+2.2	
O	PROGRAMMING METHODS	18-29	24	1/2	+2.1				O	OATRONIC RENTAL	2-6	6 2/2	0	0.0	
O	PROGRAMMING & SYS	1-3	3/8	1/8	+0.0				A	DEARBORN-STORM	24-44	41 3/4	5/8	+1.5	
L	SCIENTIFIC RESOURCES	1-2	3/2	3/8	-0.0				A	LEVIN-TOWNSEND CORP	5-11	9 1/2	1/4	-2.5	
O	SOFTWARE SYSTEMS	1-2	1 1/4	0	0.0				A	OPA, INC.	4-8	7 1/4	3/4	+1.7	
O	TBS COMPUTER CENTR	5-9	4 7/8	1/8	-2.5				A	PERMUT NET	8-15	11 1/4	3/4	-1.8	
O	TOLLEY INTL CORP	3-8	6 5/8	5/8	-8.6				N	GREYHOUND COMPUTER	7-11	8 1/4	0	0.0	
O	UNITED DATA CENTER	1-1	1 1/4	0	0.0				N	LEASCO CORP	16-25	23 1/2	1 1/2	-5.8	-2.0
O	UNIVERSITY COMPUTING	21-38	32	1/4	-2.2				O	LECTOR INT INC	2-5	5 2/8	3/4	+0.5	
A	URS SYSTEMS	1-1	1 1/4	1/4	-0.6				A	LEXIN-TOWNSEND CORP	5-11	9 1/2	1/4	-2.5	
O	U.S. TIME SHARING	1-3	1 1/8	0	0.0				O	LHC DATA, INC.	1-1	1 3/4	0	0.0	
O	VORTEX CORP	2-5	2 3/4	1/4	-8.3				N	MCC INDUSTRIES	2-8	7 5/8	3/4	+1.7	
PERIPHERALS & SUBSYSTEMS															
N	ADHORESONGRAPH-MULTI	24-48	48	0	0.0				O	SYSTEMS CAPITAL	3-7	6 7/8	1 1/4	+1.7	
O	ALPHABYTE	3-6	5 3/8	0	0.0				N	U.S. LEASING	16-30	35	3/4	+1.7	
N	AMPEX CORP	17-25	10 1/7	1/8	-3.8				EXCH. NAMED VENDOR EXCHANGE: A-AMERICAN EXCHANGE						
O	ASTRODATA	1-2	1	1/4	-2.6				L-NATIONAL EXCHANGE: D-DIVERSITY CENTER						
O	ATLANTIC TECHNOLOGY	3-8	4 1/8	1/4	-2.6				O-T-C PRICES ARE BID PRICES AS OF 5 P.M. NO LAST IN						
A	BOLY-BRAKER & NEW	6-8	6 3/4	0	0.0				TO NEAREST DOLLAR						
N	BUNKER-RAND	10-19	12 1/4	1/4	-5.8	+5.2									
A	CALCOMP	21-31	25 1/2	1 1/2	+7.8	+8.2									
O	COMINOTICS	4-9	3 3/4	0	0.0										
O	COLORADO INSTRUMENTS	3-8	4 1/8	1/4	-2.6										
O	COMPUTER CONSUM	6-10	10 3/4	1/4	-1.7	-1.4									
O	COMPUTER EQUIPMENT	4-7	7 1/4	0	0.0	-15.5									
A	COMPUTEST	12-30	30 3/4	1/4	+1.8	+1.1									
O	CONTROL CORP CORP	8-12	9 3/4	1/4	+1.2	+1.2									
O	DATA PRODUCTS CORP	6-10	9	1/4	+1.8	+1.8									
O	DATA TECHNOLOGY	4-8	6 1/2	1/2	+3.0	+3.0									
O	ELECTRONICS	4-8	6 1/4	1/2	+3.0	+3.0									
O	ELECTRONIC N & H	10-15	14 1/2	1/2	+1.8	+1.8									
O	FABRI-TEK	2-4	2 3/4	0	0.0										
O	FARRINGTON MFR	1-3	1 1/8	0	0.0										
O	FOTO-MEC INC	1-1	1 1/4	0	0.0										
O	INFOPAC INC	31-44	32 3/4	3 1/4	+7.4	+7.4									
O	INFORMATION DISPLAYS	1-2	1 1/8	0	0.0										
O	MANAGEMENT ASSIST	1-2	1 1/8	0	0.0										
A	MARSHALL INDUSTRIES	17-27	27 1/8	1/2	+1.2	+1.1									
A	MILLO ELECTRONICS	16-26	17 1/2	1 1/4	+1.8	+1.8									
A	MINIWARE DATA SCI	18-27	27 1/2	1 1/4	+1.8	+1.8									
O	ON LINE SYSTEMS INC	7-18	17 1/2	0	0.0										
O	OPTICAL SCANNING	18-21	21 1/2	1/2	+1.8	+1.8									
O	PHOTON	7-12	12 3/8	0	0.0										
O	PHOTO-MAGNETIC SYS.	1-6	2 3/4	1/4	+10.0	+10.0									
O	POTTER INSTRUMENT	16-25	25 1/2	1 1/4	+1.8	+1.8									
O	PRECISION INST.	7-16	16 1/2	1 1/4	+1.8	+1.8									
O	RECOGNITION EQUIP	14-26	26 3/8	1 1/4	+1.8	+1.8									
O	RECORD CORP.	4-8	5 3/4	1/4	+1.8	+1.8									
N	SANDERS ASSOCIATES	12-22	22 1/2	1 1/4	+1.8	+1.8									
O	SCAN DATA	6-15	15 1/4	2 1/4	+18.9	+18.9									
L	TALLY CORP.	15-22	22 1/2	1 1/4	+1.8	+1.8									
N	TELEX	15-22	22 1/2	1 1/4	+1.8	+1.8									
O	VIATRON	1-4	4 3/8	0	0.0										
SUPPLIES & ACCESSORIES															
N	ADAMS-MILLIS CORP	12-14	12 3/8	1/4	-5/8	-4.8									
O	BALTIMORE BUS FORMS	8-10	10	0	-1/2	-5.8									
A	RARRY WRIGHT	6-13	8 3/4	1/4	+0.6	+0.6									
O	DATA DOCUMENTS	7-15	21 1/2	1/4	+1.8	+1.8									
O	DUPLEX PRODUCTS INC	8-10	8 5/8	1/4	-1.4	-1.4									



Epoch 4:

**Because things are tough
all over.**

Budget cuts are just one indication of the general "tightening up" in EDP. Yet GMI's premium-priced Epoch 4 computer tape is still rolling up big sales gains.

What does that tell you?

Just this. The smart operators have learned that Epoch 4 returns more than it costs — in easily measurable increased performance.

Because Epoch 4 is 8000% tougher than the competition, you can actually cut tape expenditure by using this premium product. Our twenty-year warranty is just icing on the cake.

Sure, things are tough all over. But you can make it — if you get a tough tape going for you. And Epoch 4 is the toughest in the business.



**GRAHAM
MAGNETICS**

Graham, Texas 76048